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To Lower Weights of Printing and Writings

Changes Will Apply To Important Types of Book, Printing and Writing Papers — Directive Is Expected To Save 7,500 Tons of Paper Quarterly — Several Schedules In Order L-120 Amended.

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 11, 1945—Elimination or lowering of certain basis weights in the manufacture of printing and writing papers, as directed by the War Production Board, will result in the use of lighter weight papers and save approximately 7,500 tons of paper a quarter, WPB announced today.

Several schedules of WPB's Simplification and Standardization of Paper and Paperboard Order L-120 were amended, and Direction 1, placing further restrictions on the manufacture of book, envelope and certain fine papers, was issued today.

Amendments to Schedules I, II, and III, covering book, magazines, pamphlet, and commercial printing papers and fine writing papers, now require paper merchants or anyone buying cover papers to give their suppliers a statement that such papers will be sold and used only for the production of covers. A similar statement has been required on orders for cover papers in certain cases, but now it is required in all cases involving cover papers.

Covers Commercial Printing Papers

Changes in the basis weights of commercial printing papers covered in Schedule I include the reduction of the weight of uncoated English (machine) finish book papers for sheet music from 80 to 70 pounds per ream; uncoated book papers, supercalendered for sheet music, from 80 to 70 pounds; coated one side book papers for sheet music, from 85 to 80 pounds; and also the elimination of 25 x 38 - 60-pound uncoated offset for multicolor work. In the plain coated cover papers category, the maximum weight of 60 pounds was eliminated, leaving the weight 50 pounds, and maximum weight was reduced from 65 to 60 pounds for the various types of soil, grease and moisture-proof cover papers. Poster papers were reduced in basis weight from 55 to 50 pounds. Coated post card bristol was reduced from a thickness of .011 to .009 of an inch.

Under Schedule II, covering book papers, the standard basis weight of uncoated offset book papers was fixed at 50 pounds, and the basis weight of 60 pounds for multicolor printing was eliminated. Basis weights of plain coated cover papers were changed from 65 and 60, to 60 and 50 respectively, contingent on their use.

Fine Writing and Rag Content Types

Schedule III changes affecting the fine writing papers included the following: rag content wedding papers, eliminates the substance weight for paper 22½ inches by 28½ inches in dimensions of 120 pounds; rag content index, eliminates the substance weight 25½ x 30½ - 140; base stock for blue print and direct line paper, the standard maximum weight is fixed at 17 pounds, and the 20½ pounds has been eliminated; rag content antique (machine finish) and chemical wood pulp antique (machine finish) specialty cover papers, the 20 x 26 - 65 has been eliminated; chemical wood pulp vellum and wedding papers eliminates substance weight 22½ x 28½ - 120; chemical wood pulp index bristols are limited to 22½ x 28½ - 100 pound maximum; and the maximum weight of text papers is fixed at 25 x 38 - 50.

Schedule V covering envelope papers was amended to fix the maximum standard basis weight at 20 pounds, eliminating the 24-pound substance.

An amendment to Schedule XIV, covering papers for use in the printing of newspapers and magazines, eliminates the basis weight of 25 x 38 - 60 for uncoated offset book paper for multicolor printing. The use of 25 x 38 - 70 pound paper is permitted when a certificate is furnished by the customer stating that said paper is purchased for use as a cover paper.

Forbids Production of Certain Weights

Direction 1 to the order under Schedules V, VII, VIII, and IX prohibits the manufacture of certain papers except in the basis weights specified in Direction 1, but permits delivery of such paper produced prior to April 1, 1945. Wedding papers, including rag content and chemical wood, are fixed at 17 x 22 - 20 and 22½ x 28½ - 100 maximum weights. It also fixes maximum basis weights for rag content and chemical wood writing papers, except for domestic and foreign currency, and for checks other than counter checks, and book grade envelope papers, at 20 pounds

The maximum weight for plain coated cover paper is fixed at 20 x 26 - 50 pounds.

Contoocook Increases Wages

WEST HENNIKER, N. H., April 9, 1945—Through the efforts of Monadnock Local 472, International Brotherhood of Paper Makers, the employees of Contoocook Valley Paper Company have been granted a 2½ cents per hour wage increase.

The wage increase as granted by the WLB Region I, is retroactive to November 1, 1944. A week's vacation with pay has also been approved.

Thilmany Co. Plans Chemical Laboratory

New Department Will Occupy Space of No. 4 Paper Machine Recently Sold To Concern In South America—Combined Locks Co. Adds Improvements—More Power For Paper Mills—Other News.

[FROM OUR REGULAR CORRESPONDENT]

APPLETON, Wis., April 9, 1945—Thilmany Pulp and Paper Company, Kaukauna, Wis., has started to remodel and equip a new chemical laboratory, Dr. Martin Downs, chief chemist, announced last week. The laboratory will be located in the space provided by the removal of paper machine No. 4, which was sold recently to a concern in South America. The building is 30 by 148 feet.

The new laboratory will incorporate a small technical library, a room with controlled humidity and temperature for paper testing, laboratory bays for special jobs such as the analysis of paper, matching of colors and the chemical analysis of raw materials.

A special room will be provide dwhich will be light and dust tight, to be used for biological research and photograph work. A semi-commercial laboratory room will be provided for semi-plant scale coating machines for trial runs on waxes, asphalts, hot melt coatings and similar materials.

The laboratory will be equipped with temperature controlled ovens for checking the aging characteristics of paper and a deep freeze unit for testing papers at low temperatures which are to be used for frozen food and meat packaging.

In the controlled humidity room, testing instruments will be provided for the tests on the moisture permeability, tensile strength, softness, etc.

No immediate changes in personnel are contemplated, Dr. Downs said. However, there are a number of chemistry laboratory workers in the armed service who will be returning after the war has been ended.

Combined Locks Co. Adds Improvements

Improvements including a modern freight elevator were started last week at Combined Locks Paper Company, Combined Locks, Wis., according to L. J. Smith, mill manager.

A priority for the elevator was obtained from the War Production Board, and the elevator is expected to arrive in about 60 days. Estimated cost of the improvements is between $25,000 and $30,000, Mr. Smith said.

Navigation on Fox River Opens

The navigation season on the Fox river from DePere to Portage, Wis., and on the Wolf river to New London, Wis., was to start at 8 o'clock Monday morning, April 9, according to Lieutenant Colonel A. R. Striegel, corps of engineers executive assistant for the area. The Fox river is an important artery of traffic for coal and other supplies to paper mills and other industries in the valley.

Employees Sign for Vacations

Employees at Kimberly-Clark Corporation's mills are signing up for their summer vacations. Hourly paid workers with one year or more of continued service since January 1 of this year will receive a week's vacation with pay. Hourly workers with five years or more of continued service will receive two weeks. Choice of vacation dates are in the order of priority in each department.

Board Authorized Gilbert Co. Election

The National Labor Relations Board last week authorized an election among Gilbert Paper Company employees, Menasha, Wis., to determine a bargaining agent. The election is to be held within 60 days. The Gilbert Local No. 477, International Brotherhood of Paper Makers, American Federation of Labor, sought the vote.

Thilmany To Send Newspaper Overseas

The Thilmany Pulp and Paper Company has arranged to have the Servicemen's edition of the Appleton Post-Crescent, Appleton, Wis., sent to the 382 employees of the company in the armed ofrces.

More Power Available to Paper Mills

Thirty thousand kilowatts added capacity for the Wisconsin Public Service Corporation's power system is planned through the addition of a new turbo-generator unit of that size to the present Bayside steam station at Green Bay, Wis., according to M. H. Montross, Wausau, Wis., general manager.

Bayside station consists of three units, two of them of 10,000 KW each, installed when the plant was erected in 1926, and a third of 30,000 KW size was put into operation in 1942.

Much of the preliminary engineers has been completed. The Wisconsin Public Service Commission and the War Production Board have approved the project, which is expected to be in operation in the latter half of 1946. Total cost of the addition is estimated at $2,500,000 to $3,000,000.

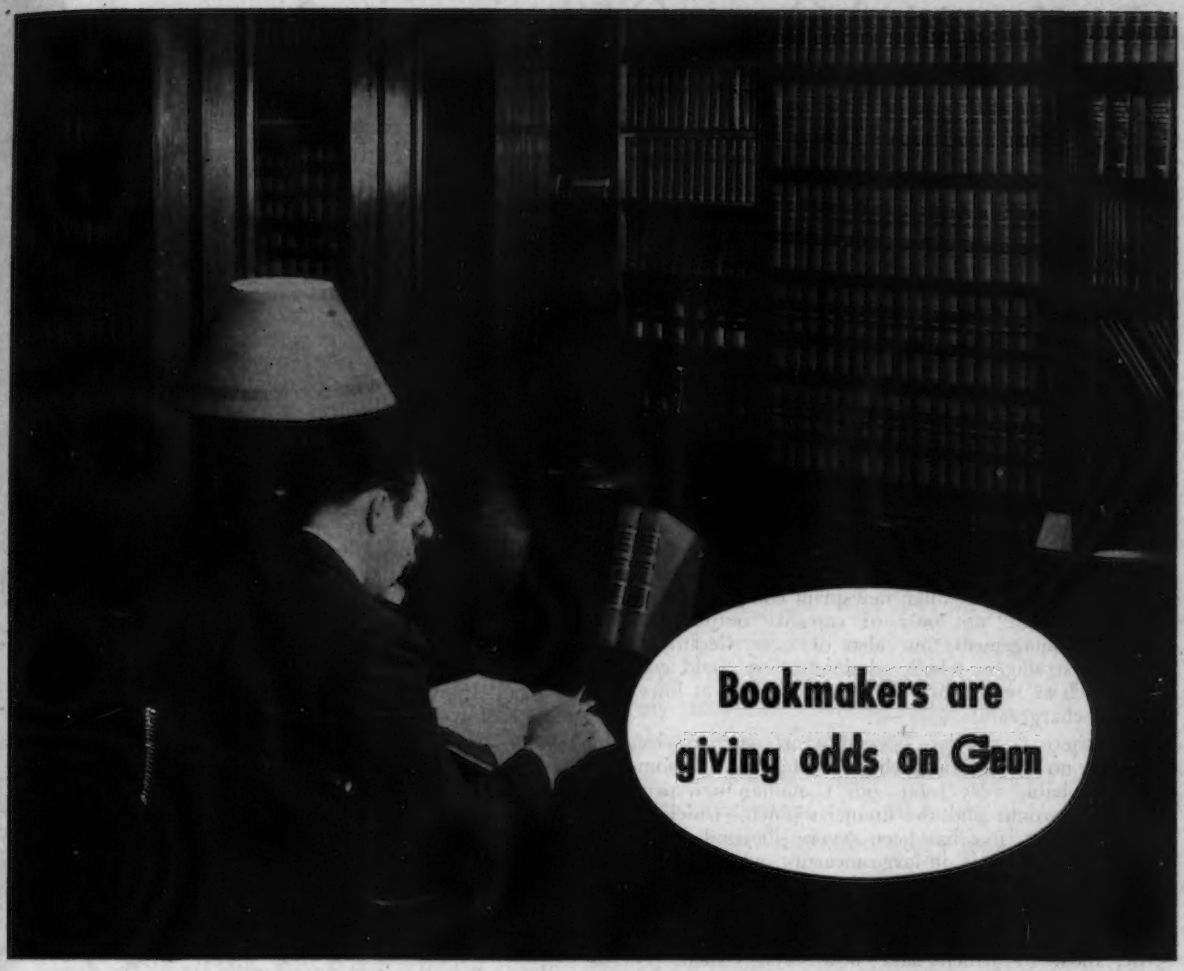
Mrs. Lida Alexander Dead

Mrs. Lida Edwards Alexander, the daughter and wife of the founders of the John Edwards Paper Company, now the Nekoosa-Edwards Paper Company, Nekoosa and Port Edwards, Wis., died Easter Sunday morning at her home at Port Edwards after a long illness.

Her father, John Edwards, came to America with his parents in the 1840's, establishing his home in the village which now bears his name. While on a visit to California in 1885 he met Lewis Miller Alexander, a young banker at Santa Rosa, Calif., whom he persuaded to come to Wisconsin in 1890 to become his business partner, and who later became his son-in-law. The John Edwards paper mill was built in 1896. In addition to enterprises in other states, Mr. Alexander conducted the affairs of the Nekoosa-Edwards Paper Company for many years following the death of Mr. Edwards.

Mrs. Alexander's son John Edwards Alexander now is president and general manager of the Nekoosa-Edwards Paper Company.

Mrs. Alexander was a member of P.E.O., Travel Class, D.A.R. and Study and Recreation Club, and was active in the Port Edwards Community church.



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These and other properties of GEON—resistance to chemicals, foods, heat, cold, light and many other destructive elements, may be had in an almost limitless variety of *planned* combinations. GEON may be made into a wide variety of forms, too—coatings for fabric and paper; flexible sheet or film for packaging materials; brief cases, upholstery; flexible or rigid extrusions and molded goods for innumerable applications. Probably you can suggest additional applications for these truly versatile raw materials.

For more complete information about GEON polyvinyl materials, write Department MM-4, Chemical Division, The B. F. Goodrich Company, 324 Rose Building, Cleveland 15, Ohio.

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Cautions Of Over-Optimism in Newsprint

Canadian Comment Cites Steadily Rising Costs of Newsprint Producers As Tempering Benefits Derived From Recent $3 Ton Increase — Overseas Exports of Newsprint — Other Industrial News.

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 9, 1945—While Canadian newsprint companies stand to benefit from the recent increase of $3 a ton granted by the U. S. Office of Price Administration, warnings are appearing here against over-optimistic views regarding the effects of the increase on the immediate outlook for the industry. For instance, the Financial *Times* of Montreal says it would be wrong to assume that the increase will enable the companies to show greatly enhanced profits from now on, or, in some cases, that any increase in profits can be expected. It continues:

"True, the greater part of the total newsprint used in the United States comes from Canadian mills, which will now receive the higher price for their product. But against this we must realize that any profits shown by Canadian newsprint companies have been the result, not only of capacity output plus efficient management, but also of every legitimate financial stratagem which administration could contrive, such as refinancing whenever possible at lower interest charges.

"As there is a limit, beyond which such devices can offer no further aid, it therefore follows that some time—probably very soon—our Canadian newsprint producers would find the financial pinch—which up to the present time has been severe—beyond endurance. In fact that is, in large measure, why the latest increase was asked for, and why it was granted."

These arguments are borne out by a study of the financial statements of the companies for the past year, most of which have now been issued. As examples, the 1944 showings of two of the major Canadian producers, Consolidated Paper Corporation and Canadian International Paper, may be quoted. Consolidated's 1944 pulp and paper tonnage was about 9% greater than for the preceding year, in which the price was $54 for eight months and $58 for four months. Yet steadily rising costs contributed to a reduction of net profits from 50 cents a share of common stock to 43 cents, or a 14% reduction, although the selling price for the whole 12 months of 1944 was $58 a ton. In like fashion, International Paper, while it showed a net profit of $2.09 a share against $2.07 for 1943, did little better than break even under the higher price ceiling.

Considered opinion here is that while the present $3 boost does not warrant hope for sharply augmented profits, it may succeed in its real purpose, which is to enable the newsprint companies to weather what remains of the war and its necessary but irksome price controls.

Costs Up, Wood Scarce

As showing some of the difficulties with which the newsprint companies are contending, in addition to all-round higher expenses, the following is quoted from the annual report of the Brompton Pulp and Paper Company, of Bromptonville and East Angus, Que.:

"Your company's ability to obtain supplies of wood is becoming increasingly difficult. Notwithstanding continued and strong representations to all Government Departments concerned, sufficient wood was not obtained to enable your company's mills to operate at full capacity. It was found necessary to reduce operations at the Bromptonville mill from six to four days per week and it is expected that operations at that plant will be equally unsatisfactory during 1945. Increasing difficulty is also being experienced respecting wood for your East Angus mills.

"American buyers who heretofore have purchased only peeled wood for shipment to the United States are now actively engaged in the purchase of rough pulpwood in the areas from which your company has always obtained the major part of its supply. Vigorous complaints have been made to both the Provincial and Federal Governments respecting the seriousness of this situation, but as yet no correction has been effected.

"The situation is a most critical one and operations during 1945 will have to be limited strictly to the amount of wood which it may be possible for your company to obtain during the year."

Canada's Newsprint Supply to U. S.

In connection with the annual report of the International Paper Company, it is interesting to note that the ouputt of the company's activities in Canada totalled 796,777 tons in 1944, against 744,649 tons in 1943, with newsprint production 512,359 tons, against 457,066. Regarding Canada's contribution to the U. S. newsprint supply, the report says:

"In Canada the industry operates under the direction of The Wartime Prices and Trade Board and the tonnage which shall be made available to U. S. consumers and its distribution is determined by the Canadian authorities and the War Production Board working together. During 1944 the Canadian newsprint industry undertook to deliver to the United States 2,400,000 tons of newsprint. This is a greater tonnage than average deliveries during prewar years, and was achieved in spite of critical shortages of labor and materials. Canada supplied 75 per cent of all newsprint used in the United States in 1944, and has committed itself to produce at the same high rate during the first six months of 1945. In 1944 Canadian International Paper increased its own newsprint production 12 per cent over 1943."

Container Corp. Elects Officers

The board of directors of the Container Corporation of America has elected the following officers: President, Walter P. Paepcke; vice president, J. J. Brossard; vice president, W. M. Dixon; vice president, I. C. Keller; vice president, J. V. Spachner; vice president, E. A. Throckmorton; secretary-treasurer, E. A. Wagonseller; comptroller, C. M. Blumenschein; assistant treasurer, C. Madsen; assistant treasurer, A. Papke; assistant secretary, H. J. Greven; assistant comptroller, E. J. Stout, and assistant secretary and assistant treasurer, Murrel J. Fischer.

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GEARS AND CERTAIN other moving parts in industrial and transportation equipment often act like an egg beater on the lubricants which protect them — and cause foaming, which may result in rupture of lubricating film, spilling of lubricant, and possible damage to machinery or equipment.

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Chicago Reports Paper Market is Tighter

Book Paper Supply Viewed Most Seriously Affected By Curtailment In Use of Paper and Raw Materials—Book Publishers' Quotas Are Cut — Salesmen Plan Golf Outing — Other Market News.

[FROM OUR REGULAR CORRESPONDENT]

CHICAGO, Ill., April 9, 1945—The paper situation in the Chicago area continues to go from bad to worse. The pulp allocations served notice on the industry here that war plays no favorites and all grades were cut in varying degrees. The book paper market was considered the most heavily affected by the most recent Government stipulations. Another element in the WPB program was adding up to a four star scare for the industry as the raw materials used in the making of paper came in for more curtailment. A 30% cut in rosin sizing and heavy cuts in chlorine supplies to mills in this area were also adding to the pessimism here. There was some speculation as to the condition of the market after victory in Europe but the consensus of opinion seemed to be that government requirements would be only slightly lessened as war continued in the East and as government proceeded with rigid controls over the civilian economy.

Waste paper collections in the area were reported definitely improved but not sufficiently to give mills in the midwest the real supply needed. Manpower continued to be a vexing problem and was expected to be no better after th German phase because of the type of war production in this area.

Publishers Quota Curtailed

Chicago, a center of book publishing and magazine publications, responded patriotically but disappointedly to this week's WPB ruling that magazines and most commercial printers must take a 13% reduction in deliveries of printing paper in April, May and June. No curtailment in the use of paper is required but in order to use as much paper as in the past the publishers and printers will have to make up the difference out of their inventory supplies. Permitted deliveries, say Chicago sources, will be held to 87% of each firm's average quarterly consumption in 1944, but exemptions were made for smaller companies and for those with low inventories. WPB orders also had another specific effect on the mid-west market, inasmuch as they are reported to require that lighter weight papers be used for many commercial printing products including news letters, art reproduction, loose leaf services, card indexes and business forms.

Consider Golf Outings

The western division of the Salesmen's Association of the Paper Industry held only a routin round table discussion meeting on April 2 at the Hotel Sherman but found time to learn that two golf outings are planned for this summer, one in June and the other possibly in August. No definite dates have been set but Jim Sensenbrenner, Kimberly-Clark Corporation, golf chairman, is reported to be selecting two of the best clubs in the district for the bob-tailed golfing program.

New Printing Firm Opens

Paper and allied trades in this area this week received a notice of the opening of a new printing firm in Chicago—the Knowlton-Washburn Company. Offices and plant are at 123 North Sangamon Street and officers include Howard G. Knowlton, George B. Washburn, Clayton W. Munger and Charles W. Koehler. Mr. Knowlton was for many years a vice president of Shattock & McKay, advertising printers and more recently has been a vice president of the American Wall Paper Company of St. Louis.

Saves on Newsprint

A Bloomington, Illinois, newspaper—the "Pantagraph"—has reported an annual savings of approximately 25 tons of newsprint through the sending of a "thin" edition sent to subscribers living entirely outside the Pantagraph area. Most of the local advertising is eliminated in the "thin" edition with national advertising, news and features retained. This procedure meets with all requirements in considering the subscriptions as paid circulations and the edition called the "Special Mail and Servicemen's Edition" is reported to be well liked by out of the state subscribers.

Gardens Under Way for Third Year

Manhattan Victory Gardens, the 400-garden project that won the highest award of the National Victory Garden Institute for the past two years, is now under way for the 1945 season, it is announced by officials of the Manhattan Rubber Manufacturing Division of Raybestos-Manhattan, Inc., Passaic, N. J.

According to James J. De Mario, Chairman of the garden committee and advertising manager of Manhattan, the gardeners are already at work, cleaning away old vegetable waste and preparing for early planting. In view of a food shortage that may be worse than last year's, it is expected that the gardeners will better their record of the past two years.

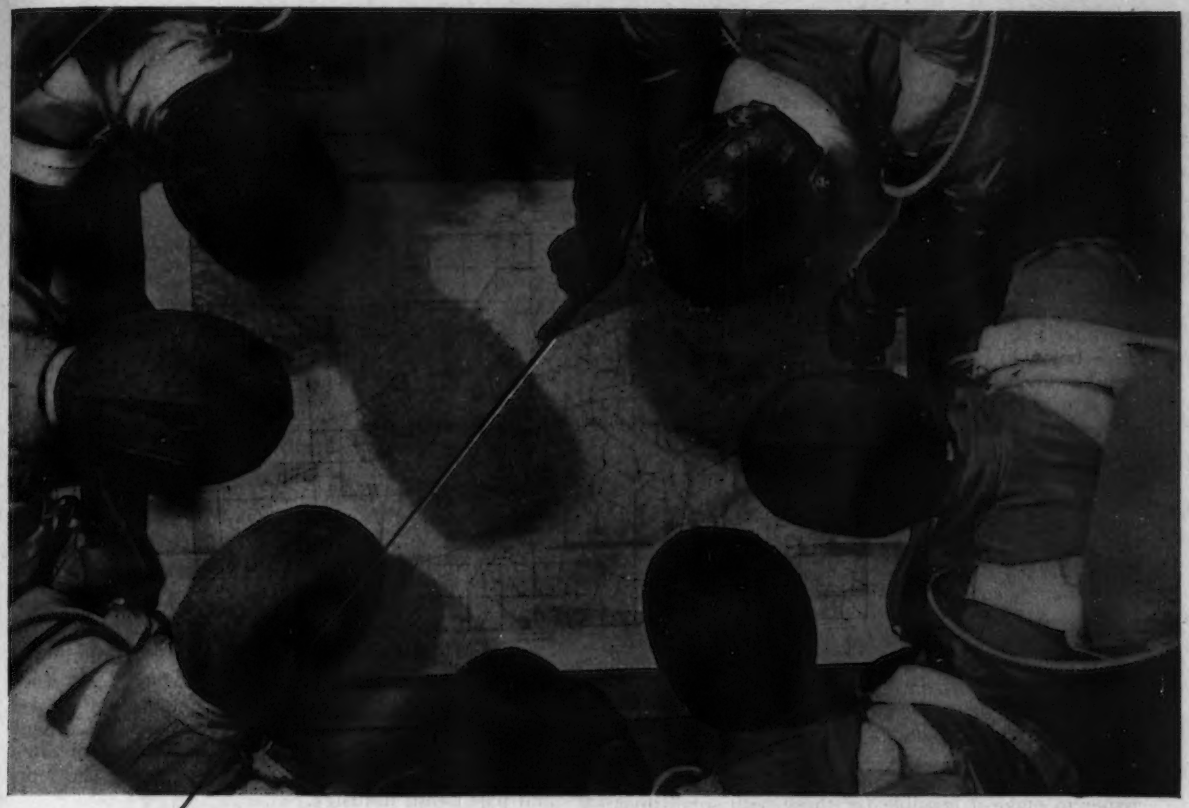
The land for the 10½ acre project is leased by the company and is divided into plots approximately 20 by 40 feet. Fertilizer, water, tools with an attendant, and a parking lot are provided by the company. The gardeners work the plots at all hours, usually going there on the way to and after coming off different shifts. The project, worked enthusiastically by Manhattan employees, has resulted in off-setting the shortage of fresh vegetables among families of the company's employees.

Diesel-Electric Locomotives

H. K. Porter Company, Inc., builders of locomotives since 1866, have just issued a new 44-page catalogue on Diesel-Electric locomotives.

In addition to giving complete specifications on both narrow and standard gauge locomotives ranging from 30 to 100 tons, the catalogue reveals pertinent engineering and construction data. Diesel-Electric advantages and necessary information for selecting the proper type of locomotive are also considered.

A copy of this catalogue, No. L-45-A, may be obtained by writing to H. K. Porter Company, Inc., Pittsburgh 22, Pa.



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THE RESINOUS PRODUCTS & CHEMICAL COMPANY

WASHINGTON SQUARE, PHILADELPHIA, PA.

Printers' Paper Supply Cut

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 11, 1945—Because of an expected shortage of printing paper in the second calendar quarter of this year, most commercial printers will be limited in the amount of paper they may accept from their mills or suppliers to 87% of their average 1944 quarterly consumption, the War Production Board said today.

It now appears that there will be no second-quarter curtailment in the amount of paper a printer may consume, below his present quota, which is fixed at 75% of his 1941 consumption, WPB said. However, a printer's second quarter paper deliveries are reduced 13% below his average 1944 quarterly consumption if his over-all inventory was 32 days' supply or more on April 1, under an amendment to L-241, the Commercial Printing Order, it was explained by Printing and Publishing Division officials.

Small users consuming 25 tons of paper or less per quarter and printers with less than 20 days' supply are protected so that their inventories will not be depleted, although they may not order or accept in excess of 100 per cent of their average 1944 quarterly consumption, WPB said.

Similar restrictions have been placed on the book and magazine publishers, operating under Limitation Orders L-245 and L-244, respectively, who use the same types of papers.

In no event may a commercial printer's inventory be greater than 50 days' supply on June 1, WPB officials said. Restrictions as to deliveries to printers with relatively large inventories will provide enough paper to make it possible for those with small inventories to accept their full deliveries, and relieve the demands on the paper mills, the officials explained.

This delivery reduction plan was adopted after an inventory survey of the printing industry, which indicated that paper supplies were adequate to supplement reduced receipts from paper suppliers in the second quarter, WPB said. Unless the commercial printing industry meets its specific problems, WPB officials said, a cut in consumption quotas will be necesary.

A new provision of L-241 states that no one may sell or deliver paper that he has reason to believe will be used in violation of the order, and no one may print on any paper, or bind it, if he has reason to believe it will be used by a publisher in excess of his allowable consumption quota under any of the printing limitation orders.

As a conservation measure, the basis weights of printing paper that may be used for a number of products were reduced. The reduced weights affect the following types of printing: art reproduction, news letters, loose-leaf services, card indexes and a number of legal, business and functional items.

Commercial printers, both established and new, who do not require more than 1¼ tons of paper a quarter may use that amount in the second quarter without restriction under Order L-241.

Definite control over publishing activities that are not recognized as magazine, book or newspaper publishing is established under a new paragraph that covers miscellaneous publications for which the issuer receives a consideration either from the sale of copies or from the inclusion of advertising. Some of the items now covered by quota restrictions on the issuer are: almanacs; amusement, travel, railroad, airline and hotel guides; directories, calendars, diaries, appointment books, school yearbooks, song sheets, sheet music, horoscopes, pamphlets, leaflets, booklets, collections of pin-up pictures, and news letters, bulletins and services, including financial and credit news. Publishers or printers of this type of matter are limited in their annual consumption of paper to 75% of the weight of paper used for such material in 1941 or 1944, or five tons, whichever is the greatest.

Fred C. Boyce Re-elected

Fred C. Boyce, Wauwatosa, Wis., was re-elected President of the D. J. Murray Manufacturing Company, Wausau, Wis., at the annual meeting March 21. Other officers elected were M. P. McCullough, Chicago, Ill., vice president; C. E. Staky, executive vice president and general manager; A. W. Plier, secretary; and J. S. Alexander, treasurer. The last three are residents of Wausau. Directors elected include the officers named above, D. C. Everest, George L. Ruder, and Grover Keith, all of Wausau.

Mr. Boyce, who is popularly known as the "father" of the American Pulp and Paper Mill Superintendents Association, and was its first president from 1919 to 1921 inclusive, is known in the paper industry primarily for his enthusiasm and energy. He began his work with paper mills as a paper maker in 1883. Now heading a manufacturing company that is engaged in 90% war work, he is still maintaining interest and contact with paper mills, as he is now an officer of the Superintendents Association on the finance committee. It was reported at the annual meeting that post-war planning includes a number of new items and improved equipment for the pulp and paper mill industry.

To Be Assistant Sales Manager

PHILADELPHIA, Pa., April 9, 1945—The appointment of J. J. Duffy, Jr., as assistant manager of sales of the Pennsylvania Salt Manufacturing Company, Philadelphia, has just been announced by George B. Beitzel, vice president in charge of sales.

Mr. Duffy, a graduate chemical engineer, has been associated with the company since 1937. After completing the company's Student Training Course in 1939, he was assigned to the Special Chemicals Division and, for the next three years, served as sales-service engineer for that division in the New York State area.

He was then called to the Philadelphia office in 1942 to assist William P. Drake, manager of sales, as development and service engineer on the new products of the Special Chemicals Division made necessary by the wartime needs of the industries served by that division.

In his new capacity, Mr. Duffy will assist Mr. Drake in supervising the activities of the Special Chemicals Division's field men.

J. F. Thompson Joins Battelle Institute

Joseph F. Thompson, formerly research chemist with the Dennison Manufacturing Company, Framingham, Massachusetts, has joined the staff of Battelle Institute, Columbus, Ohio, where he is engaged as a research engineer in its Graphic Arts Research Division.

Mr. Thompson is a graduate of the Franklin Union Institute and has studied additionally at Northeastern University, Boston. He is a member of the Technical Association of the Pulp and Paper Industry.

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Yes, it will just fit, because there is an I-R condenser to fit the needs of any pulp or paper mill. It will fit into your operation and maintenance schedules too. You will find it highly efficient and you will find that it requires a minimum of maintenance attention.

There is a complete line of Ingersoll-Rand steam condensers and steam-jet ejectors for prime mover application and for other vacuum services in the paper mill. Ask the Ingersoll-Rand service engineer for further details. Ingersoll-Rand Company, 11 Broadway, New York 4, N. Y.

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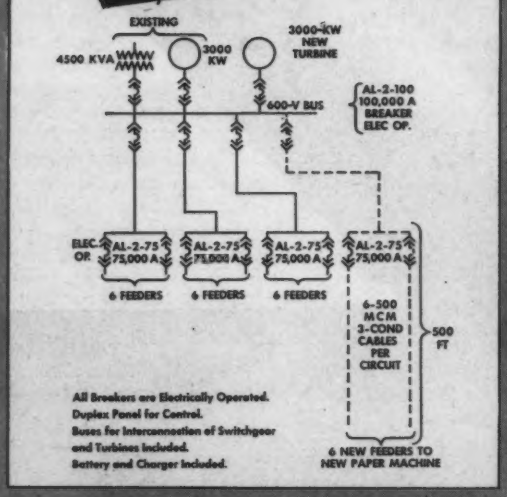
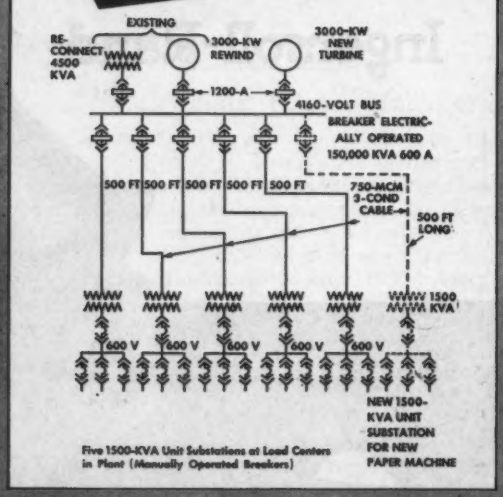
COMPARE THESE TWO WAYS OF EXTENDING A POWER SYSTEM TO HANDLE A NEW PAPER MACHINE

600-VOLT SYSTEM MODERNIZED $137,000



Addition of new 3000-kw turbine and new 600-volt breakers throughout. (Increased capacity makes installed breakers inadequate.) Estimated replacement cost ($107,500, plus $29,700 for additions to system serving new machine): $137,200.

4160-VOLT LOAD-CENTER SYSTEM $127,000

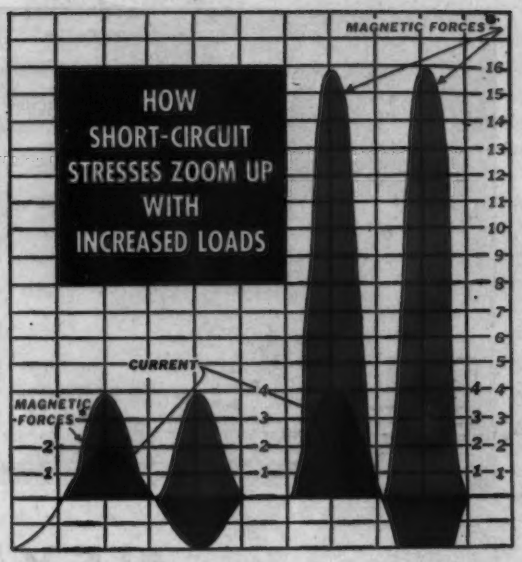


New turbine added and old turbine rewound for higher voltage. New metal-clad switchgear and unit substations installed throughout. Total cost, including rewinding of turbines: $127,000.

BUY ALL THE BONDS YOU CAN— *AND KEEP ALL YOU BUY*

SAVING

ELECTRIC POWER



THE addition of power capacity needed to drive new machines can turn all your switchboards and circuit breakers into a menace to safe and continuous operation. More power capacity means higher short-circuit currents, which can mean stresses far beyond the capacity of your switchgear. That's the lesson of the chart at the right, which shows that the destructive magnetic forces go up with the *square* of the short-circuit current.

For a "safe and sane" power change-over to accompany plant expansion, there's a better answer than new 600-volt switchgear. It is a shift to *load-center power distribution*, with primary circuits at 4160 volts. Over-all costs will generally be lower, and the mill will have a modern, flexible system that can be easily expanded in the future. *General Electric Company, Schenectady 5, N. Y.*

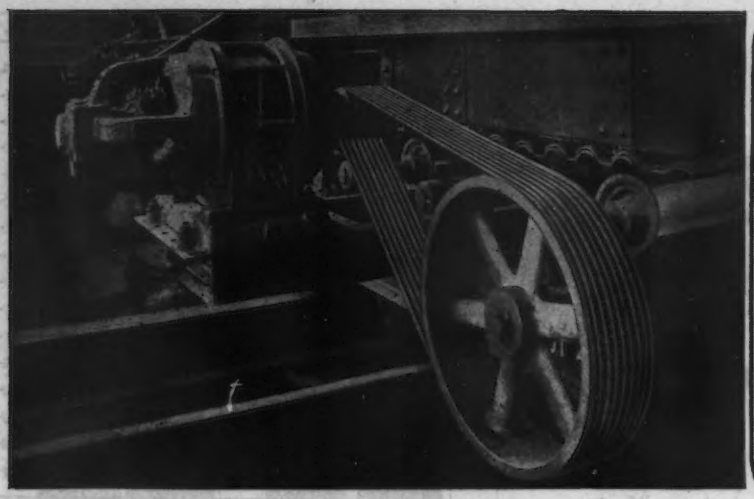
Metal-clad switchgear for 4160-volt service—compact factory-built equipments that help protect personnel as well as continunity of power supply. Assemblies of standard units can provide for any required combination of generator and primary-circuit control.

Unit substations are key factors in a modern, fully protected power-distribution system. These are located adjacent to the load-center areas they serve. Because the transformer sections are cooled with Pyranol* askarel, which can't burn, these substations can go anywhere.

*Trade-mark Reg. U.S. Pat. Off.

GENERAL ELECTRIC

LOAD-CENTER POWER DISTRIBUTION SYSTEMS



GET THE *Time tested buy* IN V-BELT DRIVES

Wood's the LONG LIFE LINE

NEXT TIME BUY Wood's

Buy Wood's drives because, gauged both by built-in quality and reliable performance, they exemplify the outstanding buy in the V-Belt field.

Buy Wood's V-Belt drives because they are *designed* for efficient power transmission. They do the job of turning energy into work—bringing power from its origin to the driven machinery with minimum loss.

Wood's V-Belt drives render trouble free service ... provide inherent day-in and day-out reliability at a low figure for maintenance.

Wood's products have stood the test of time. Since 1857 this complete line of transmission equipment—with an earned reputation for excellence—skillfully designed and efficiently manufactured, has been a dependable stand-by of industry.

Wood's V-Belt drives and other products of Wood's manufacture, will serve you faithfully in the post war era. Plan for post war now. Engineering consultation welcomed. Details furnished upon request—or see your conveniently located Wood's distributor.

EVERYTHING IN TRANSMISSION

Bearings — Collars — Clutches — Couplings — Contactors — Hangers — Pillow Blocks — Pulleys — V-Belt Sheaves and Complete Drives

T. B. WOOD'S SONS COMPANY, CHAMBERSBURG, PENNA.

Branches: Boston, Mass. Newark, N. J. Pittsburgh, Pa. Cleveland, Ohio Detroit, Mich. Houston, Texas

Strategic Planning
—FRAMEWORK FOR FINAL VICTORY

In this war, more than in any other war in history, victory depends on broad strategic planning. For huge land, sea and air forces must be distributed over vast areas and deployed into positions of tactical advantage from which decisive blows may be struck. This calls not only for military skill but for the specialized skills for which America is famous—technical ingenuity, mechanical ability and especially the application of "mass" methods to production, transportation, construction and the use of many technical sciences on a large volume scale. Indeed, America possesses that vital "Margin of Experience" in these activities which permits strategic planning on an unprecedented scale and has already established the framework for the final victory.

In every field of science, commerce and industry, this "Margin of Experience" proves again and again to be a factor vital to success. Niagara offers it in the field of electro-chemical products. For Niagara has pioneered constantly in the development, improvement and adaptation to new uses of Liquid Chlorine, Caustic Potash, Caustic Soda, Carbonate of Potash and Paradichlorobenzene. Rely on Niagara's "Margin of Experience" for greater success in the use of these products.

AN ESSENTIAL PART OF AMERICA'S GREAT CHEMICAL ENTERPRISE

Niagara ALKALI COMPANY
60 East 42nd Street, New York 17, N. Y.
CAUSTIC POTASH • CAUSTIC SODA • PARADICHLOROBENZENE
CARBONATE OF POTASH • LIQUID CHLORINE

ADVENTURES IN THE "MARGIN OF EXPERIENCE"

Joins Bulkley, Dunton Export Staff

Harry Vernon, who has been associated with the paper export field for many years, has joined the export staff of Bulkley, Dunton Paper Company, S. A., 295 Madison avenue, New York 17, New York.

HARRY VERNON

Mr. Vernon has returned to the trade after having been honorably discharged from the U. S. Army Signal Corps with which he served 32 months.

Reduces Paper Use in Magazines

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 11, 1945 — Further shortage of printing paper available to the magazine industry during the second quarter of 1945 will be met by a 13% reduction in paper deliveries to magazine publishers during that period, but no curtailment in use is required, the War Production Board said today.

An amendment to WPB Order L-244, issued today, provides that all magazine publishers except those using 100 tons or less per year and those with dangerously low inventories, must reduce their paper receipts in the second quarter to 87% of their average quarterly consumption in 1944. Publishers using 100 tons or less yearly and others with inventories of 20 calendar days' supply or less on April 1 must restrict their paper receipts in the second quarter to 100% of their average quarterly use in 1944. The amended order also provides that publishers, whose inventories on April 1 amounted to 21 to 32 calendar days' supply, are entitled to second quarter delivery quotas varying from 99% to 88% of their 1944 average quarterly use.

Publishers with extremely low inventories and small publishers were exempted from the full impact of the delivery restrictions so that they may be able to continue operating at their permitted rate of consumption. The small publishers thus exempted account for only about 4 per cent of the magazine industry's total paper consumption.

The amended order also provides that no publisher may have an inventory exceeding 50 calendar days' supply on and after June 30, 1945. This will mean that in some cases publishers will have to curtail their second quarter paper receipts more than 13% below their 1944 average quarterly use. The deeper cuts applying to publishers with high inventories will compensate for the less stringent restrictions on small users and those with low inventories, and thus will balance the over-all demand with the paper supply available to the industry. Similar restrictions on deliveries have been placed on book publishers and commercial printers, operating under Limitation Orders L-245 and L-241, respectively.

The delivery reduction plan was adopted after a survey indicated that inventories in the hands of magazine publishers are apparently sufficient to supplement reduced receipts in the second quarter.

WPB officials pointed out, however, that a further cut in consumption quotas will result unless the industry succeeds in meeting the difficult problems that will be caused by local dislocations.

It is also provided that all magazine publishers must make a new one-time certification to their paper suppliers. Several other changes in the order were made for clarification.

Changes Name to Rogers Corp.

The Rogers Paper Manufacturing Company of Manchester, Conn., will henceforth be known as Rogers Corporation, by action of its stockholders, it was announced Monday, April 2.

"Materials manufactured by Rogers, and the uses of these materials, have been developed far beyond the narrow description given them by the old name of the company, which was founded in 1832," executives explained. "Continued research aims at additional developments, and Rogers activities have for some time included conversion of materials into finished forms by our Fabricating Division," it was said.

The company manufactures and fabricates an extensive group of special fibrous materials in laminated sheet form. The same Rogers process also produces several plastic materials. "Rogers-Bords," as the company designates its materials, are used extensively for electrical insulation, for shoe midsoles, for structural members and for many other purposes. New uses discovered for them during the war have ranged from bomber seats and handles for mess kit knives to container closures and automobile license plates.

Collects More Waste Paper

During February, 66,969 tons of waste paper collected in the five boroughs of New York City were delivered to the consuming mills, it was announced today by the Salvage Division of the War Production Board in this area.

The February collections of waste paper represent an increase of approximately 3,000 tons over January collections, although February is a shorter month. The 66,969 ton figure represents waste paper collections of 19 pounds per capita which is somewhat less than the record collection of 74,680 tons last October, representing 21 pounds per capita. Much credit is due the local volunteer organizations and the waste trades in this city, whose cooperation is yielding steadily increasing collections.

Waste paper collections in New York City have been running about 12% to 15% of the national total. At this time national totals for February are not available, but it is probable that local collections represent an equally good percentage of the national collection total.

N.P.T.A. Executive Committee Meets

Due to enforced cancellation of the usual Annual Convention, a meeting of the Executive Committee of The National Paper Trade Association was held Tuesday, April 3, at the Waldorf, New York City. President R. M. Harris, The Alling & Cory Company, Rochester, N. Y., presided and there was a full attendance including G. E. Carpenter, Carpenter Paper Company, Omaha, vice president in charge of the Wrapping Paper Division; A. W. Towne, Blake, Moffit & Towne, San Francisco, in charge of the Fine Paper Division; J. O. Bulkley, Bulkley, Dunton & Co., New York, treasurer; Ex-President R. C. Kettles, Jr., Charles F. Hubbs & Co., New York; H. A. Hartinger, Paper Supply Company, Minneapolis; H. L. Cowan, Franklin-Cowan Paper Company, Buffalo; L. A. Ramaker, the Bouer Paper Company, Milwaukee, and A. H. Stein, Yorkville Paper Company, New York City, who substituted for W. W. Hinrichs.

Former presidents who accepted the invitation to attend included A. M. Miller, W. N. Gillett, G. F. Marquardt, F. Bendel Tracy, and G. G. Cobean.

Luncheon guests, whose remarks contributed greatly to the interest of the meeting, were E. W. Tinker, executive secretary, American Paper and Pulp Association, and Lt. Colonel J. K. Javits, former counsel of N.P.T.A.

Since the usual nomination and election of officers could not take place, the executive committee recommended to the board of directors that the present officers be requested to continue to serve for the ensuing year or until a general meeting is held at which their successors can be elected and installed.

Survey reports covering the operations of fine, wrapping and dual houses for the calendar year 1944 were presented by J. H. Londergan, director of the Statistical Research Division.

After thorough discussion, various matters of policy were acted upon and plans were outlined as to immediate future activities.

It was unanimously voted that if conditions permit an annual meeting in 1946, it should be held the last of March or the first of April rather than the month of February as heretofore and should include an exhibit by manufacturers and converters if adequate accommodations can be secured.

By subsequent arrangement with the Waldorf, New York City, the dates, April 1-3 have been tentatively set for the 1946 Convention.

John Goldstein Retires

Stein, Hall & Co., Inc., New York, manufacturers and distributors of starches, gums, dextrines and other materials used by many industries, and importers of burlap and other commodities, has announced that John Goldstein, treasurer and a director, will retire from active business July 1, after 37 years of association with the company.

Joining Stein-Hall as a shipping clerk in 1908, when the late Leo Stein and Frank G. Hall were partners in a small but fast expanding enterprise, Mr. Goldstein's advancement and the company's growth came together.

"Mr. Goldstein will retire to his farm in Chalfont, Bucks County, Pa., where he will have ample opportunity to enjoy the rest which he so richly deserves," said Arthur L. Strasser, chairman of the Board of Directors. "We are glad to say that he will be available to us in a consulting capacity, because this will give us the benefit of his vast knowledge of our business, and his great ability, which has played so important a part in the company's development for almost four decades.

"We who have worked with him for many years appreciate his valuable contributions to Stein-Hall's success, and treasure highly our warm friendship with him, which has deepened from year to year.

"In expressing the sincere wish that Mr. Goldstein will enjoy many years of health and full satisfaction in his retirement, we know we speak not only for ourselves, but also for his many friends in the industries we serve."

Chas. T. Dole Made Chairman

Pursuant to the elections held at the annual meeting of the stockholders on February 8, 1945, and the meeting of the directors on March 16, 1945, of the Champion-International Company, the officers of the company for the ensuing year are as follows: Charles T. Dole, chairman of the executive committee; A. Murray Howe, president; William T. Dole, vice president and treasurer; Sheldon E. Wardwell, vice president and clerk of the corporation; Roland B. Hammond, assistant treasurer.

Charles T. Dole, who had served many years as vice president and manager of sales was elected president of the company in 1932, succeeding George Fred Russell, deceased.

As chairman of the executive committee he will be active in the affairs of the company.

A. Murray Howe is promoted from the office of vice president in charge of manufacturing to the presidency, and continues as a director.

William T. Dole continues as vice president and treasurer. He is also a director and purchasing agent.

Sheldon E. Wardwell, of the law firm of Wardwell, Ranney & Allen, becomes a vice president and clerk of the corporation, and continues as a director after serving as chairman of the executive committee.

Roland B. Hammond was chosen to serve as assistant treasurer.

Canada Short of Waste Materials

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 9, 1945—The Department of National War Services reports a critical shortage of waste paper and rags required for the manufacture of paper products. As a result an intensified campaign for the salvage of these materials is now being conducted throughout the Dominion. Waste paper stocks, it is reported, are at an alltime low and some mills have been compelled to operate on short time for lack of stock. There is an immediate need, the Department reports, for an increase of 33⅓% in the flow of waste paper to the mills, and every effort must also be made to salvage large rags for use for airplanes and war machinery, and clippings of wool and cotton for making roofing paper and shingles, needed for devastated areas overseas. Local salvage campaigns are being conducted by leading citizens and groups throughout the Dominion. It is pointed out that packages for supplies parachuted to troops in enemy territory are largely made of waste paper, and that practically all other supplies to our men at the front have to be packaged in wrapping paper, cardboard of fiberboard, and that this explains the critical shortage of that vital raw material, waste paper.

WALWORTH

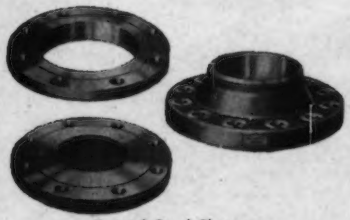
Pipe Fittings

A complete line of standardized types in

STEEL
in series 150 to 1500

Cast Steel Fittings

Steel Welding Fittings

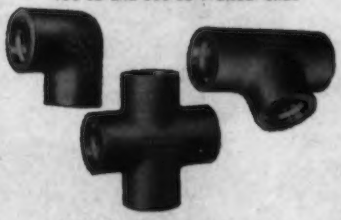


Forged Steel Flanges

BRONZE

125 Lb and 250 Lb, Screwed ends

150 Lb and 300 Lb Walseal ends



3,000 Lb O.W.G., Walseal ends

IRON

125 Lb and 250 Lb Cast Iron

150 Lb Malleable Iron

300 Lb Malleable Iron

Walworth's comprehensive line of pipe fittings is made in a wide range of types and sizes to meet every piping requirement. A few of the many regular Walworth fittings are illustrated above. All Walworth fittings are made to the highest standards of quality, both as to dimensional accuracy and metallurgical properties. In design, construction, and performance, they reflect Walworth's 103 years' experience in the manufacture of quality valves and fittings.

For detailed information on Walworth's complete line of valves, fittings, and pipe wrenches, see your local Walworth distributor or write for a free copy of Catalog 42.

12 AWARDS
TO 4 PLANTS

WALWORTH

valves AND fittings

60 EAST 42nd ST., NEW YORK 17, N. Y.

LABORATORY CONTROL

To assure strict adherence to specifications, sample test bars of the metals from which Walworth Pipe Fittings are made are subjected to regular testing in Walworth laboratories. These and other regular controls and inspections assure the high quality of all Walworth Pipe Fittings. The illustration shows a test on a cast iron transverse bar.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

Mersize makes this chemist's paper boats float longer...

In this standard ink flotation test, the slower the ink penetrates through the floating samples the better the sizing of the paper.

Experience has proved that approximately one part Mersize to three parts rosin will often double, triple or quadruple the efficiency of this sizing. (See table.)

Also, the amount of rosin furnished to the beaters can be cut by 50% or more on hard sized papers. This lower rosin content results in a whiter paper, when it is made, and less yellowing as it ages.

In addition, Mersize supplied as a paste handles easily in the mill, is easily mixed, and is stable in storage.

For complete Mersize information or technical assistance in adapting it to your operations, write, wire or phone: MONSANTO CHEMICAL COMPANY, Merrimac Division, Everett Station, Boston 49, Massachusetts.

MILL SIZING DATA

Mill	TYPE PAPER	% Rosin	% Mersize	% Alum	Time of Ink Flotation Test
1	50% Rag	1.75	—	1.0	25 sec.
	Bond Paper	1.5	.2	1.0	75 sec.
2	Hard Sized 50% Rag	3.1	—	3.5	22 min.
	Bond Paper	1.5	.5	3.5	35 min.
3	Sulfite	1.4	—	2.5	30 sec.
	Bond Paper	.7	.35	2.5	54 sec.
		.9	.35	2.5	91 sec.
4	100% Rag	2.75	—	3.0	2 sec.
	Onionskin Paper	1.33	.67	3.0	11 sec.

Form: Mersize is provided as an alkaline water dispersion. This is a viscous liquid containing 50% Mersize.

MONSANTO CHEMICALS
SERVING INDUSTRY...WHICH SERVES MANKIND

She depends on the papermaker too!

When Mrs. America returns from market she may have many things—milk, cheese, meat, butter—in paper packages—paper packages that must be sterile. She depends on the icebox to keep them fresh—to retard bacterial growth—but the icebox can't do its job unless the papermaker first provided a sterile package paper.

Food container paper must be bacteria-free — not only from disease-producing organisms, but from all "harmless" bacterial growths that impart unpleasant odors and tastes, or cause actual spoilage of food.

You can assure such bacteria-free paper with The W&T Chloramine Process. Wallace & Tiernan Engineers, from their broad experience in the paper field, will gladly recommend the most practical method of application for your plant.

WALLACE & TIERNAN COMPANY, INC.

MANUFACTURERS OF CHLORINE AND AMMONIA CONTROL APPARATUS

NEWARK 1, NEW JERSEY • REPRESENTED IN PRINCIPAL CITIES

P-45

GREASES..ENGINEERED TO

BEARINGS . . . COOL AS A CUCUMBER

"Since we changed to Tycol Green Cast Grease, our bearings run cucumber-cool," says one chief engineer. No matter how severe the service, Tycol Green Cast Greases assure better lubrication . . . less maintenance. The reason? They contain more high-grade cylinder oil—less soap—which means better performance in every application.

NO COSTLY, TIME-CONSUMING REPAIRS

A well-known mill encountered the usual trouble of hot bearings and excessive wear on a huge mixer—the grease lost its body under heat, ran out of the bearings and damaged the machine—changing to Tycol Green Cast Greases changed this condition immediately. Tycol greases hold their body, prevent over-heating and wear on bearings and last longer.

COSTLY WEAR OF ROLLER BEARINGS STOPPED

"Tycol Green Cast Grease never leaves a soap or foreign deposit in the bearings," stated one operator. Gone is the worry over delays and costs caused by separation and breakdown of grease formerly used. Tycol grease resists breakdown in structure, thus assuring maximum lubrication.

DRUMS! DRUMS! DRUMS!
War needs make it extremely important that all empty drums be returned promptly.

INDUSTRIAL TYCOL OILS-GREASES

TIDE WATER

TIDE WATER OIL COMPANY OF CANADA, LTD.
Toronto • Montreal

"TAKE-IT"

ON THE

TOUGHEST JOBS!

Peak production . . . without worry of breakdown due to friction and wear . . . is made easier with Tycol Green Cast Greases.

Engineered to "take-it," without thinning down and dripping, Tycol Green Cast Greases avoid wasted lubricant, lost bearings and unnecessary "time out". These modern lubricants keep bearings . . . pistons . . . gears friction-free and cool. They supply the "film of protection" needed to give power a chance to produce with a minimum of waste.

Call your nearest Tide Water Associated office. Let them suggest the Tycol Green Cast Grease engineered to "take-it" on your specific problem . . . and remember, Tycol greases are made from high quality cylinder stock and well refined neutral oil, with a minimum of soap — a maximum of oil . . . more efficient lubrication per pound of grease.

PENETRATION

This informative handbook gives clear, concise descriptions of the basic tests used to determine important lubrication properties—Penetration, Viscosity, Pour Point

WHAT IT MEANS IN GREASE — SEE TIDE WATER "LUBRICANIA"

and many others. For your FREE copy, write to Tide Water Associated Oil Company, 17 Battery Place, New York 4, N. Y.

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SIGNAL CORPS PHOTO

Death for the Enemy —packed in PAPER

Out of its paper jacket—into the waiting barrel of a giant gun—then roaring on its way into the enemy lines. Up to the very moment of its mission of death, each shell is packed and protected in paper. Shell cases are made of paper board. Bullets and hand grenades are packed in paper cartons.

Today *paper* is a vitally essential war material—serving in countless ways at home, in industry and at the battle fronts. The paper industry, meeting the emergency with resourcefulness and skill, is making an enormous contribution to carrying the war to a victorious conclusion.

KENWOOD WOOL PRODUCTS

F. C. Huyck & Sons is proud to be serving an industry so essential to the war program. Our skill, our facilities and our 75 years of experience are always available in solving the special felt problems created by urgent wartime paper needs.

F. C. HUYCK & SONS

Kenwood Mills

Albany New York

Draper's

ATLAS OF AMERICAN PAPERMAKING

No. 5 PUBLISHED BY DRAPER BROTHERS COMPANY • CANTON, MASSACHUSETTS

Map Copyright by L. D. Post, Inc., New York. American Map Co., N. Y.

HIGH LIGHTS: Connecticut's first paper mill was built in Norwich, by Christopher Leffingwell, in 1767. He manufactured by hand about 1,300 reams per year and employed possibly a dozen men.

From this small beginning, Connecticut has developed an important papermaking industry, ranking 18th in the production of paper and paperboard. With the transformations from rag stock to wood pulp her manufacturers have made readjustments, tending toward specialties ranging from thin tissues to thick boards and papers of high dielectric properties, and also of phenolic resin content.

Connecticut is also famous for the building of the first American Fourdrinier machine in the year 1829, in the shops of Phelps and Spafford at South Windham. Here, their successors, the Smith & Winchester Manufacturing Company, continue the building of paper mill equipment.

Connecticut has 12 Fourdriniers, 16 cylinder machines, 18 wet machines and 3 Yankees. The major portion of the State's production is a variety of paperboards.

Draper Felts for Efficiency

DRAPER BROTHERS COMPANY

Woolen Manufacturers Since 1856

Canton, Massachusetts

RALPH E. BRIGGS Sales Manager

BRADFORD WEST PITTSFIELD, MASS. • WILLIAM N. CONNOR Jr CANTON, MASS. • L. H. BREYFOGLE KALAMAZOO, MICH. • CHAS. E. BERTSCHY MILWAUKEE, WIS. • W. L. CAMPBELL SAVANNAH, GA. • BALFOUR GUTHRIE & CO. Ltd. PACIFIC COAST

Cuts Paper Use in Books

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 11, 1945—Continuing shortage of printing paper available to the book publishing industry during the second quarter of 1945 will be met by a 15% cut in printing paper deliveries to book publishers during that period, but no curtailment in use within consumption quotas is required, the War Production Board said today.

An amendment to Limitation Order L.245, issued today, provides that all book publishers who use more than 50 tons of paper per year must reduce their paper receipts in the second quarter of 1945 to 85% of their acceptance of paper in the second quarter of 1944 or 21¼% of their 1944 consumption, whichever is greater.

Small publishers are exempted from the full impact of the delivery restrictions in order that they may be able to continue operating at their permitted rate of consumption. The small publishers thus exempted account for about 5% of the industry's total consumption of paper. The amended order also provides that no publisher may have an inventory on and after June 30 exceeding his inventory on March 31, 1945.

The delivery-cut plan was adopted after a survey indicated that inventories in the hands of the book publishing industry are apparently sufficient to supplement reduced receipts in the second quarter. However, WPB officials pointed out that a further cut in consumption quotas will result unless the industry succeeds in meeting the difficult problems that will be caused by inevitable dislocations.

Today's amendment also provides that all book publishers must make a new one-time certification to their paper suppliers. Our changes in the order are for clarification.

Miscellaneous publications not classifiable as books, magazines or newspaper under the respective orders are now included in Schedule 11 of the Commercial Printing Order, L-241, and are subject to quota restrictions if the ussuer receives a consideration either from the sale of copies or the inclusion of advertising or other material therein.

B. C. to Plant 9,000,000 Trees

Reforestation work for the British Columbia Government calls for the planting of 9,000,000 trees, according to an announcement made in the B. C. Legislature by E. T. Kenney, Minister of Lands. He said that next year the forest service plans to plant 10,000,000 trees.

During 1944, 7,850,600 trees were planted on 10,302 acres of land, he further said. Total area now replanted is 44,400 acres on which 36,000,000 trees are growing.

Cost of producing the trees for planting was $3 per 1,000. Further reforestation had been held up by a lack of skilled labor in nurseries, but the department plans to utilize many war veterans, he said.

He announced the department planned to establish a nursery in the interior to produce young trees for that area as those grown on the coast were not hardy enough for that climate. He said he doubted if farmers could produce trees as cheaply as the department in its nurseries.

EASY LOADING

A feature of the Roberts Grinder that Cuts Labor Costs • helps maintain high production • promotes good housekeeping

Supplying the pulpwood to the stone is largely mechanical with the Roberts Grinder. The wood is delivered directly to the charging door by a conveying system. Here one operator—no additional help is required—easily maintains the supply in two adjacent grinders producing up to 100 tons of pulp in twenty-four hours. The operator guides the wood into the feeding pocket over rollers. It is not lifted. This ease of loading is a feature of the Roberts Grinder that has helped to cut grinder room crews from 50% to 70%. It also helps in maintaining the high production possible with high-speed grinding. Feeding the wood to the stone is continuous. There are no interruptions in the production and flow of stock. The conveying system is a great aid in maintaining good housekeeping in the grinder room. It contributes to the very clean and orderly appearance of Roberts Grinder installations.

THE APPLETON MACHINE COMPANY

APPLETON, WISCONSIN • Eastern Sales Representatives—CASTLE & OVERTON, INC., 630 Fifth Avenue, New York City

ROBERTS *Continuous* GRINDER

NO OTHER DRIVE BABIES THE BELT

The Flat Leather Automatic Tension drive is so easy on the belt . . . that a G&K "Research" Leather Belt will outlive a rubber V-belt on a corresponding drive . . . better than 2 to 1.

Tension is a prime factor in belt wear. Normally if tension is too high, the belt breaks down. If tension is too low, abrasion and heat, caused by slippage, wear it out. But on a F.L.A.T. drive, the pivoted base regulates tension automatically—high only when the load is heavy, low when the load is light.

The thinner cross-section of the flat leather belt minimizes belt wear caused by internal heat originating from continual flexing around pulleys on short centers.

In the infrequent cases when a flat leather belt does need replacement, the new belt can be made endless on the drive, there's no tension adjustment, no pulley alignment problem. Ask your G&K distributor for a demonstration.

Due to the properties of its exclusive tannage and curry, "Research" Leather Belting not only gives you maximum belt service, but also improves in load-carrying capacity during its entire life.

- Pre-stretching according to hide characteristics eliminates non-elastic stretch.
- Exclusive "weight-controlled" curry gives maximum pulley grip—meaning it can run with less tension (which wears belts and bearings).
- Patented "tension-cementing" gives positive ply adhesion strength.

Write Graton & Knight Company, 337, Franklin Street, Worcester 4, Massachusetts, for new, free Belting Manual.

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FINANCIAL NEWS

New York Stock Exchange

High, Low and Last for Week Ending April 7, 1945

STOCKS

	High	Low	Last
A. P. W.	4⅛	4⅛	4⅛
Armstrong Cork Co.	45½	43¾	43¾
Celotex Corp.	15¾	15⅛	15⅛
Celotex Corp., pf.	20	19½	20
Certain-Teed Products Corp.	8¼	7¾	8
Certain-Teed Products Corp., pf.	148	148	148
Champion Paper & Fibre Co.	30⅜	30¼	30¼
Champion Paper & Fibre Co., pf.	112¼	112	112
Congoleum Nairn Co.	27½	26¼	27½
Container Corp. of America	27	26⅛	26¾
Continental-Diamond Fibre Co.	11¼	10⅜	10⅜
Crown-Zellerbach Co.	22⅛	21½	21¾
Crown-Zellerbach Co., pf.	104	103½	103½
Dixie Cup Co.	18½	18½	18½
Dixie Cup Co.—A	48½	48½	48½
Flintkote Co.	26⅜	25½	25⅞
Flintkote Co., pf.	...	...	...
Robert Gair	5⅜	5¼	5½
Robert Gair, pf.	17	16½	16⅝
International Paper Co.	24⅛	21¾	22½
International Paper Co., pf.	91¾	90	90
Johns-Manville Corp.	109¾	108¼	109½
Johns-Manville Corp., pf.	...	...	...
Kimberly-Clark Corp.	43½	42½	42½
Mac Andrews & Forbes	32¾	32¼	32¾
Mac Andrews & Forbes, pf.	...	...	...
Masonite Corp.	42¼	41½	41¾
Mead Corp.	13	12¾	12⅞
Mead Corp., pf. A—6%	103¼	103¼	103¼
Mead Corp., pf. B—5½%	98½	96	96
National Container Corp.	15½	14⅛	15½
Paraffine Companies, Inc.	63¾	63	63
Paraffine Companies, Inc., pf.	109½	109⅛	109⅛
Rayonier, Inc.	17⅛	16½	17⅛
Rayonier, Inc., pf.	36½	35⅞	36¼
Ruberoid Co.	35	34¼	35
Scott Paper Co.	44½	43¾	43¾
Scott Paper Co., pf.	109¾	109¼	109¼
Sutherland Paper Co.	32	32	32
Union Bag & Paper Corp.	15⅜	15⅛	15½
United Paperboard Co.	6¾	6⅝	6⅝
U. S. Gypsum Co.	83	81	83
U. S. Gypsum Co., pf.	190	190	190
West Virginia Pulp & Paper Co.	23⅝	23½	23½
West Virginia Pulp & Paper Co., pf.	111	110½	111

BONDS

Abitibi Pulp & Paper Co. 5s '53	101½	100½	101½
Celotex Corp. 3¾s '55	103¼	103	103
Certain-Teed Products Corp. 5½s '48	101	101	101
Champion Paper & Fibre Co. 4¾s 50	...	...	...
International Paper Co. 6s '55	110	110	110
International Paper Co. 5s '47	104¾	104	104
Mead Corp. 3½s '53	...	...	...
West Virginia Pulp & Paper Co. 3s '54	...	...	...

New York Curb Exchange

High, Low and Last for Week Ending April 7, 1945

STOCKS

	High	Low	Last
Great Northern Paper Co.	36¼	35¾	35¾
Hummel-Ross Fibre Corp.	7⅜	7⅜	7⅜
St. Regis Paper Co.	6⅜	5⅞	6
St. Regis Paper Co., pf.	...	...	...
Taggart Corp.	...	...	...

BONDS

American Writing Paper Co. 6s '61	100½	100⅛	100½

St. Lawrence Corp. Group Reports

[FROM OUR REGULAR CORRESPONDENT]

MONTREAL, Que., April 9, 1945—The annual reports of the St. Lawrence Corporation group of companies show that in each case the position in respect of income and excess profits taxes has now been determined and is reflected in the latest balance sheets. The St. Lawrence Corporation report shows that during the year the corporation's holdings of 24,811½ common shares of Lake St. John Power and Paper Company, Ltd., were sold to St. Lawrence Paper Mills Company, Ltd., already a larger holder of Lake St. John common.

With proceeds of the sale of these shares the Corporation purchased 24,825 shares of its own "A" stock, which were cancelled, resulting in an increase in capital surplus of $546,550 to $895,086.

Dividends received from Brompton during the year totaled $298,301. Expenditures absorbed $16,252, and dividends on the Corporation's "A" stock were $263,395, resulting in a surplus of $18,653, bringing total to $37,874. In 1943, "A" dividends totalled $288,193, resulting in a deficit of $6,049.

Balance sheet shows investments in subsidiaries valued at $14,980,937, consisting of 510,613 shares of St. Lawrence Paper common and 298,319 shares Brompton. Bank loan is shown at $305,967 against $318,414.

Brompton Pulp & Paper Co.

Brompton Pulp and Paper Company Limited reports net profit of $309,752 or $1.03 per share for the year ended December 31, 1944, compared with $300,859 or $1.00 a share in 1943.

Arthur F. White, president, states that during the year $117,092 was spent on additions to plant and equipment in the East Angus division. He notes a decrease of $785,004 in net working capital, and states this was due to substantial expenditures at the Red Rock division.

Operations were at capacity at East Angus during 1944, but were reduced to four days a week at Bromptonville due to wood shortage. Manufacturing costs continued to rise, the president notes.

Work on Red Rock Mill Progresses

Completion of construction of the Red Rock mill having been decided on, Mr. White reports that satisfactory progress is being made and it is expected the mill will commence operations in the latter part of 1945.

Net expenditure at Red Rock to date is shown at $1,967,412, including $1,064,279 in 1944. An estimated further expenditure of $3,700,000 on capital account is required to complete the project, the report states.

Completion of the Red Rock Mill, the report adds, will necessitate rearrangement of the company's production facilities and will result in a temporary reduction in output. Some falling off in earnings in 1945 is therefore expected, it declares.

St. Lawrence Paper Mills

Annual report of St. Lawrence Paper Mills Company Limited for the year ended December 31, 1944, shows lower earnings than in 1943, reflecting higher operating costs.

Net profit was $430,571 or $3.31 per preferred share, against $506,432 or $3.89. Dividend payments were $3 per share against $3.75. Preferred arrears amounted to $66.50 per share.

After capital expenditures of $251,391 during the year and after purchase of 30,524 additional common shares of Lake St. John, net working capital shows a decrease of $70,186 at $4,137,231.

The company now owns 81,993 Lake St. John common shares out of 100,000 outstanding. The company also owns all of Lake St. John's 18,000 shares of 6% preferred.

Lake St. John Power and Paper

Lake St. John Power and Paper Company Limited, subsidiary of St. Lawrence Paper Mills Company Limited, reports sharply expanded earnings in statement for 1944.

Operating profit was $1,526,702 in 1944 against $1,491,730 in 1943. After tax provision of $200,962 against $300,000, net profit was $308,770 against

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$185,987. This was equal, after preferred dividends, to $2.01 per common share against 78 cents.

Balance sheet shows an increase of $372,000 in net working capital to $3,445,948.

Current assets were $3,780,832 against current liabilities of $334,884.

J. I. Rankin, president, states that notes of the Hearst Companies, which amounted to $1,032,324 at the end of 1943, were reduced to $632,188 in 1944, and a further payment of $317,438 was received in January, 1945.

Mr. Rankin states that redemption of bonds and debentures through sinking fund operations was substantially in excess of requirements. During the year $314,200 par value of the company's 5½% bonds and $310,000 of 5% debentures were redeemed and cancelled. Funded debt at the end of 1944 was thereby reduced to $4,850,400 of 5½'s and $3,147,500 of 5's.

Capital expenditures totalling $213,767 were made in 1944, being chiefly for extension and improvement of the sulphite department.

Retires from Franc-Graham Paper Co.

The Franc-Graham Paper Company, New York, announces with regret that Wilfred Graham, who has been secretary-treasurer of the company since it was founded in 1921, retired on March 31. Mr. Graham's health has been impaired for several years and he is moving his home immediately to Los Angeles where the more moderate climate will be beneficial to him. Jerome Franc continues as president of the company and Mr. Graham is succeeded as secretary-treasurer by Henry M. Franc, son of the president. Henry M. Franc has been with the company for 13 years and has recently been honorably discharged from the army after having spent 16 months with the Army Air Corps. The company is located at 25 West 15th street, New York and carries in stock complete lines of writing and printing papers, cardboards and envelopes, which include the products of many prominent mills.

No Date Set for Abitibi Payment

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., April 9, 1945—No decision has yet been made, it is understood, as to the date of the second payment of $43.07 per $1,000 bond of Abitibi Power and Paper Company, which was approved by the court in November, 1944. Before the payments may be made, application will have to be made to the court to set a payment date, and no application has yet been made. Funds for this payment were not expected to be available before this month. The full payment is applicable to principal and will involve the sum of $2,078,860.

Lily-Tulip Corp. Nets $3.85

The Lily Tulip Cup Corporation and subsidiaries, for 1944, reports a net profit of $683,129, equal to $3.52 a share on 193,539 average number of shares outstanding, compared with $730,825 or $3.85 each on 189,539 shares, for 1943, before $100,000 deduction for contingencies.

Great Northern Profits Off

The Great Northern Paper Company and subsidiaries, for 1944, reports a net profit of $1,666,978, equal to $1.67 a share, compared with $1,859,895, or $1.86 a share, in 1943.

Acquires Ontonagon Fibre Corp.

Acquisition of the Ontonagon Fibre Corporation, Ontonagon, Mich., is announced by the National Container Corporation which says "The Ontonagon Fibre Corporation owns and operates a kraft board mill producing approximately one hundred tons daily. With this acquisition, we now have a daily capacity of approximately five hundred tons of kraft pulp and board representing an increase of about 100% within the last twelve months. It is our intention, subject to governmental regulations, to convert the entire production of this mill into shipping containers in our own converting plants.

"We estimate that with the acquisition of this mill, our consolidated annual sales will increase by about $4,000,000 or on the basis of $21,500,000 annual sales as compared with approximately $17,600,000 for the year 1944 when the entire production of this mill is converted into the finished product in our own converting plants.

"A substantial increase in our earnings should result from the normal profit earned by this mill on its product and a further increase of profits from the converting of its product into shipping containers in our own converting plants.

"Funds for the purchase were provided in part from our treasury and in part from a three-year term loan with a New York bank."

Warns of Over-Optimism

In commenting upon the outlook for the pulp and paper industry after V-E Day, E. W. Tinker, Executive Secretary of the American Paper and Pulp Association, stated April 6 that there was a grave danger of over-optimism with respect to augmented supplies. A very heavy demand is anticipated to bring inventories back to normal and to meet known enlarged requirements. There appears to be no immediate possibility of obtaining sufficient woods labor to bring woods supplies back to normal and the pulp requirements of the paper industry will no doubt continue to be greatly curtailed.

There is a possibility of some foreign pulp reaching the domestic market but in view of anticipated heavy demands in Europe the full available inventory in Scandinavia cannot be looked upon as a potential supply for the domestic market.

Continued pressure to augment available woods supply from every source is necessary, as well as a continued effort looking to maximum salvage of waste paper.

Passaic Plant Gets Army-Navy E

Nearly 2,000 miles of bullet-sealing aircraft fuel hose has been produced by the United States Rubber Company's Passaic, N. J. plant since the beginning of the war, Herbert E. Smith, president of the company, said today at a colorful Army-Navy "E" presentation ceremony in the plant.

The Army-Navy "E" flag was presented to William C. Bowker, factory manager, by Major General Oliver P. Echols, assistant to General H. H. Arnold commanding general of the Army Air Forces. General Echols paid high tribute to the workers for the volume of their production and for the quality of their workmanship.

He lauded the engineers and chemists who overcame many obstacles in converting production from natural rubber to synthetic.

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READING HOISTS

Container Use Restricted

[FROM OUR REGULAR CORRESPONDENT]

WASHINGTON, D. C., April 11, 1945—Restrictions on the use of hot drink cups, cold drink cups, flat bottom dishes, liquid-tight paper containers and paper milk containers have been tightened by the War Production Board because of increasing demands for these sanitary food containers and the decreasing supply of material for their manufacture, WPB announced today.

Action was taken by revising Limitation Order L-336, governing sanitary food containers. The term "in-plant feeding" was eliminated from the amended order, and the use of hot drink cups was permitted only for certain "primary" feeding operations. The practical effect of this change will be to limit the use of hot drink cups to feeding in industrial plants, hospitals and certain other minor but essential operations, WPB said. In addition, the quota rate for use of the hot drink cups was reduced from the previous 80% to 75% of average monthly use in the first quarter of 1944.

Definitions of hot drink cups and hot food cups were changed to include all cups that in any stage of their manufacture would fall within the definition of these cups. This was necessary in order to insure that the cups would not be waxed and thus processed beyond the stage of being used as hot drink or food cups at a time when demand for the latter cups exceeds production, the WPB Containers Division explained.

In order to take care of a new military requirement, flat bottom dishes were defined, and 75% of their production was set aside for the military overseas.

The use of liquid-tight containers was restricted to food products intended for human consumption, in order to prevent their use for packing non-food products.

The use of paper milk containers was restricted to the packing of fluid milk, other dairy products and fruit and vegetable juices. The restriction was necessary to channel paper milk containers into uses for which they were originally designed.

Paper Situation Tense

[FROM OUR REGULAR CORRESPONDENT]

INDIANAPOLIS, Ind., April 9, 1945—The paper trade here was rather glad to see the first quarter of the year pass, but it passed with little prospect for improvement in supplies for the second quarter unless hostilities in the European theater are brought to an end shortly. Even if this occurs, it is believed here that little improvement in civilian supplies will be seen for quite some time. However, jobbers and manufacturers are struggling along as best they may and the civilian consumer is being given his quotas as best can be figured. It is believed, though, that when the struggle in Europe is over, the manpower situation in the Indiana paper factories can be eased a trifle.

Some indication of the newsprint phase of the business here came recently when the Indianapolis Star came out with no display advertising at all. The only advertising in the paper was church, amusement and classified. This was done because the paper found itself at the end of the quarter with its quota practically used up. This is the second time in the history of the paper that such action had to be taken. All newspapers continue to turn business away.

The coming of an exceptionally early spring has stimulated already the demand for building paper and roofing. A large amount of remodeling is on the cards this spring and summer and it is expected more new construction will be authorized than was the case a year ago. Generally speaking, the jobbers have fair stocks on hand.

Box and container demand continued heavy last week with priority orders being filled in fair volume. The amount going to civilian consumers continued light.

Blueprints for Salvage

Tons of engineering blueprints, some containing priceless aviation secrets, find their way each year into the Glenn L. Martin Company's annual two and a half million pound scrap paper collection, according to C. A. Carnegie, supervisor of the company's conservation department. It is estimated the annual total is the largest single contribution to the paper salvage drive in the Baltimore area.

Originally burned for security's sake, the blueprints are now subjected to a shredding process which obscures their contents, before being baled and trucked to the Maryland Waste Paper mill at Elkton, Md., Carnegie said. He explained that the new process, requiring special care and costly machinery, would not have been undertaken except for the need to conserve paper in wartime.

The quantity of waste blueprints, though an exceptionally high quality of paper, is far exceeded by other items. These include tabulating cards, ledger paper, packing paper, paper towels, as well as corrugated paper, boxes and cartons.

To Enforce Compliance

WASHINGTON, D. C., April 11, 1945—Because of continuing shortages of fiberboard shipping containers, the War Production Board today took drastic action to enforce compliance with the provisions of Limitation Order L-317 covering the use of new fiberboard shipping containers. WPB's Compliance Division has been engaged for some time in "spot checking" hundreds of packers on their use of these containers, WPB said.

Direction 3 to Order L-317, issued today, specifies that the packer who did not keep adequate written records of lawful usage of fiber shipping containers in 1944 and 1945 may not accept delivery of new fiber shipping containers for use in packing products in Schedule III of the order, or for use in making wholesale or retail deliveries, until such time as WPB establishes a base quota for him.

A packer who does not have adequate records showing his lawful use of fiber shipping containers in 1944 and 1945 should file a letter of appeal with the Containers Division of WPB to have a quota established for him. This application must include his best estimate of new fiber shipping containers (in terms of footage and poundage of containerboard) he used in 1944 and 1945 for each class of products listed in Schedule III of L-317 and a separate report for wholesale and retail deliveries of all products.

Where a packer does not have these complete data, it might be advisable for him to apply to the Containers Division with such information on 1945 usage as he has immediately available, in order to obtain a temporary quota, WPB said.

Direction 3 does not affect a small user who accepts no more than a total of $500 worth of fiber shipping containers (cost price to him) for all products in any calendar year, nor does it apply to containers used to pack products not covered by Schedule III.

The new direction stresses the record keeping requirement. A packer must determine his 1944 and 1945 lawful usage of new fiber shipping containers that are subject to the quota restrictions of Order L-317 and must preserve for inspection for WPB officials a written record of his figures and work sheets.

This direction also authorizes the Compliance Division of WPB to issue individual "stop" telegrams halting the acceptance of new fiber shipping containers in cases where a packer has not kept adequate records.

HISTORICAL HIGHLIGHTS OF PAPERMAKING NO. 12

Dutchmen are ingenious

Late in the seventeenth century, the Dutch Papermakers were up against it. German competition was too keen. Germany had plenty of water power to stamp rags to pulp—Holland had wind power which was insufficient to lift the mighty stampers.

But Dutchmen are ingenious. One, whose name is lost to posterity, invented a cylinder beater. This invention, using much less power, produced as much pulp fibre in one day as eight stampers. The "Hollander" named after the inventor's mother country put Dutch papermakers on top again.

The Hollander is still in use today. Modern papermakers can recognize the elements of their own improved Hollander in a description of the seventeenth century type. "A solid wooden roll, fitted with about thirty iron knives, revolved in an oblong wooden tub that was rounded at both ends over a metal or stone bedplate. The rags were kept in constant motion and lacerated between the roll and stone bedplate."

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PAPER
TRADE JOURNAL
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Henry J. Berger, Editor

COMING EVENTS IN PAPER INDUSTRY

New England Section. Technical Association of the Pulp and Paper Industry—Third Friday of each month at the Roger Smith Hotel, Holyoke, Mass.

Delaware Valley Section. Technical Association of the Pulp and Paper Industry—First Friday of each month at the Engineers Club, Philadelphia, Pa.

Lake States Section. Technical Association of the Pulp and Paper Industry—Second Tuesday of each month at the Conway Hotel, Appleton, Wis.

Kalamazoo Valley Section. Technical Association of the Pulp and Paper Industry—First Thursday of each month at the Park, American Hotel, Kalamazoo, Mich.

Empire State Section. Technical Association of the Pulp and Paper Industry—Second Thursday of each month at the Woodruff Hotel, Watertown, N. Y.

Chicago Professional Paper Group. Third Monday of each month except July and August at Chicago Bar Association, Chicago, Ill.

PAPER SITUATION TENSE

Consumers of paper in the current second quarter are beginning to experience increasing difficulty in obtaining supplies. As the minimum authorized tonnage of paper has been reduced 178,480 tons from the first quarter, a more severe shortage for civilian uses appears inevitable. The production of newsprint continues unchanged at 180,000 tons for the current quarter and the only increased output in other types of paper are 2,500 more tons of special industrial papers and 3,700 more tons of building paper. The minimum authorized tonnage of paperboard has been increased 47,954 tons in the second quarter. The output of containerboard was increased 22,369 tons; folding boxboard (waste), 16,333 tons, and building board, 23,052 tons. The total authorized minimum production for the current quarter consists of 2,020,000 tons of paper and 2,325,000 tons of paperboard.

In its summary of the paper supply situation, the latest issue of the Industry Survey of the Department of Commerce emphasizes the severe shortages that are expected to occur. The report states that drastic shortages in paper for civilian uses will be felt during the current quarter unless adjustments are possible. Domestic paper consumers will be confronted with dwindling supplies of many groundwood printing papers, book, fine paper, wrapping, sack and grocery bag papers and also certain sanitary papers. The effects of production curtailments, in the second quarter, the report states, will probably be gradual and full repercussions likely will not be felt until May or June in most instances, because of possibilities of withdrawing further from already low distributors' and consumers' inventories. Printers expect to absorb most of the production cut in printing papers through inventory withdrawals. The retail trades and manufacturers of civilian goods will also be able to postpone the day of reckoning through use of stocks but not to the same degree.

In commenting on distributors' stocks, the report points out that paper merchants' inventories are low relative to sales volume, while retailers such as grocery stores, drug stores, hardware stores, etc., are already short on wrappings and bags. In fact, retailers will probably encounter an even tighter pinch than the net curtailment in production would indicate in view of retail sales running 11% greater in value in the first quarter, compared with an identical period last year. A rough adjustment in value of sales for price changes indicates the actual volume of retail sales is about 8% greater than a year ago. To handle a greater movement of goods with less packaging papers will indeed be a problem for many retailers and some of the British practices of bringing shopping bags or carrying unwrapped items will become more commonplace.

The Department report explains that the recommended total minimum production of paper and paperboard for the second quarter totaling 4,371,000 tons, which is 31,000 tons less than authorized for the first quarter, is significant in that paper has been reduced by about 79,000 tons while the output of paperboard has been increased by 48,000 tons. This cut in recommended paper production does not indicate a drop in requirements for paper, but a decline in the quantity of wood pulp available for its manufacture. Military requirements for both paper and paperboard continue to be increased. The increase is substantial and civilian supplies of paper will be reduced by a corresponding amount. Probabilities are that some grades of kraft paper will be the most seriously affected. Kraft pulp is now a critical material, most of it going into fiber shipping containers, which have to be strong and tough to withstand overseas shipment and continued rough handling. Within the next quarter kraft products in all probability will be placed under close control.

The price of roll newsprint on contract was increased $3 a ton in March. The Department states that the maintenance of the present newsprint consumption quotas for the printing and publishing industry is becoming increasingly difficult in the face of increased demands from the Armed Services and other Government agencies. Indications are that a deficit of approximately 45,000 tons between supply and allowable consumption will develop by June 30. This deficit will probably have to be met through a curtailment in deliveries which will require drawing upon inventories. Newspaper publishers and printers will thus not be compelled to accept a cut in allowable consumption but will be directed to cut their delivery orders by at least 6% for a three-month period effective April 1. The supply situation may be complicated in the near future by the congestion in transportation facilities. Canadian newsprint authorities recently have announced that approximately 90,000 tons of newsprint are being held at mills in Canada for lack of shipping facilities. This piling up of surplus stocks has already forced one mill to close down and may similarly affect a number of others.

WPB Conservation Order M-387, Rosin, issued last February, limits manufacturers of paper and paperboard in each 1945 quarter, to 70% of the amount of rosin used in the coresponding quarter of 1944 or 27,000 pounds, whichever is greater. Certain limitations were placed on inventories. On April 1, 1945 natural resins were placed under allocation control. Limited imports and a shortage of substitute materials are responsible for a serious situation in these materials. This action was taken by issuance of Schedule 96 to the chemical allocation order, M-300. Initial allocations will be made for the current month of April. Under allocation controls, no supplier may use natural resins or deliver them to any person except as specifically authorized in writing by the War Production Board.

Canadian Pulpwood Supply Favorable

[FROM OUR REGULAR CORRESPONDENT]

TORONTO, Ont., April 9, 1945—Canadian pulpwood interests expect to be able to meet all their commitments for pulp and paper this year. There were more men in the woods this last winter than there were the winter before and absenteeism has not been so great. More men returned to their jobs after the Christmas holidays than in other years. Another favorable factor was the early snow, which resulted in earlier hauling, although the early break-up put a stop to hauling earlier than expected.

Pulpwood producers aimed at the production of seven million cords for the 1944-45 season, an increase of about a half million cords over the previous season. Had the favorable working conditions continued until the usual date, this high production figure would have been considerably exceeded. The unusually heavy snowfall of the winter will help considerably in assuring good water levels for the delivery of pulpwood to the mills.

Production Ratio Report*

(Production as per cent of six-day capacity)

COMPARATIVE WEEKLY SUMMARIES

Current Weeks—1945		Corresponding Weeks—1944	
Feb. 24	89.7	Feb. 26	87.7
Mar. 3	87.8	Mar. 4	87.0
Mar. 10	87.7	Mar. 11	88.5
Mar. 17	89.4	Mar. 18	90.7
Mar. 24	92.1	Mar. 25	88.5
Mar. 31	*88.9*	Apr. 1	85.7

COMPARATIVE MONTHLY SUMMARIES

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	88.7	88.5	88.1	87.6	88.7	89.8	80.3	90.6	88.2	92.5	90.6	82.4	88.1
1945	86.7	89.4	*90.2*										

COMPARATIVE YEARLY SUMMARIES

	1938	1939	1940	1941	1942	1943	1944	1945
Year to Date	67.2	79.7	85.7	89.2	103.6	88.6	88.4	*88.4*
Year Average	71.5	83.4	85.6	97.4	90.4	87.8	88.1	

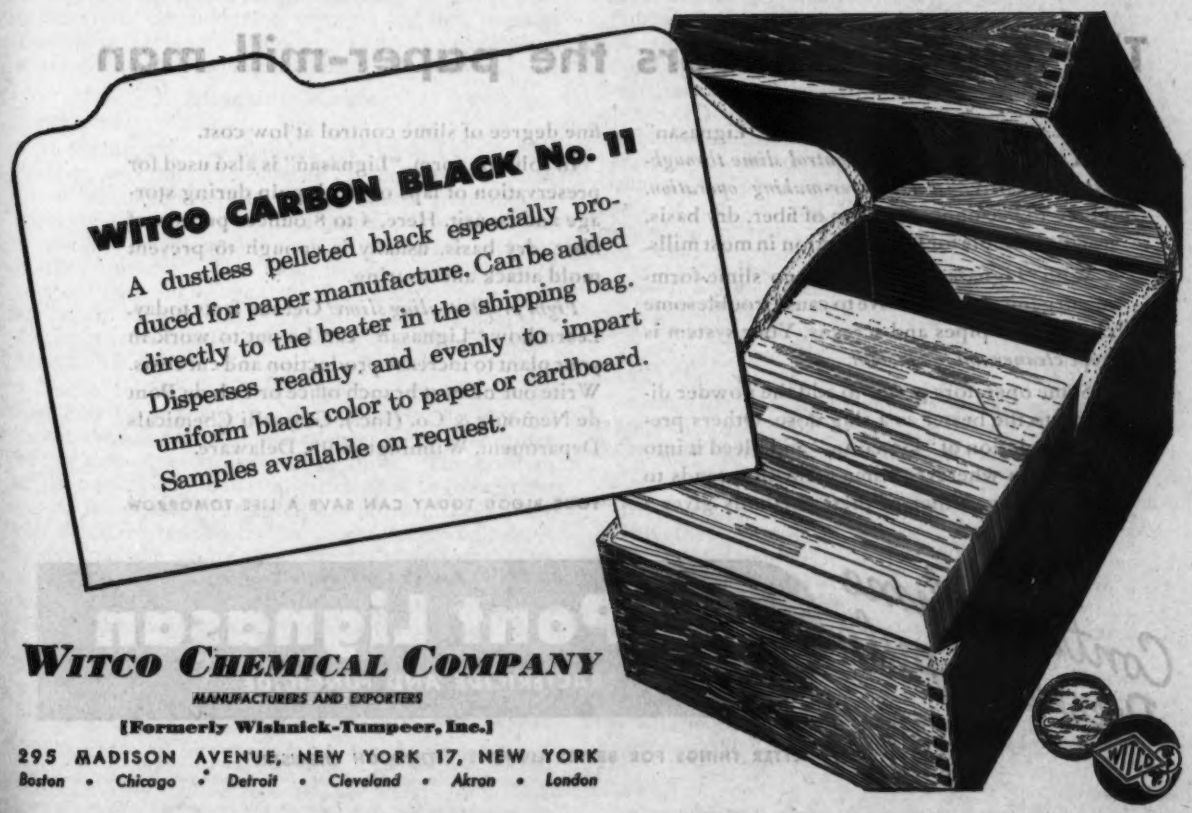
*Based on tonnage reported to American Paper and Pulp Association. Does not include mills reporting to National Paperboard Association, except in isolated cases where both paper and paperboard are produced and separate tonnage figures are not readily available. Does not include mills producing newsprint exclusively.

PAPERBOARD OPERATING RATIOS†

Current Weeks—1945		Corresponding Weeks—1944	
Feb. 24	97	Feb. 26	93
Mar. 3	96	Mar. 4	95
Mar. 10	94	Mar. 11	95
Mar. 17	95	Mar. 18	95
Mar. 24	99	Mar. 25	97
Mar. 31	*100*	Apr. 1	93

Year	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.	Year Avg.
1944	90	96	95	96	96	96	85	96	92	95	95	85	93
1945	91	95	*97*										

†Per cents of operation based on "Inch-Hours" reported to the National Paperboard Assn.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BETTER THINGS FOR BETTER LIVING . . . *THROUGH CHEMISTRY*

Section of the
TECHNICAL ASSOCIATION
OF THE PULP & PAPER INDUSTRY
122 E. 42nd St., New York 17, N. Y.
Edited by R. G. Macdonald, Secretary

Analysis of Bleaching Powder, Bleach Liquor, and Bleach Sludge*

Revision of TAPPI Tentative Standard T 611 m-44

Bleaching powder, obtained in the form of a dry powder, is believed to be a combination of calcium hypochlorite [$Ca(OCl)_2$], calcium chloride ($CaCl_2$), calcium hydroxide [$Ca(OH)_2$], and water *(1)*. When dissolved in water to make bleach liquor, $Ca(OCl)_2$ acts as the bleaching agent. Bleach liquor may also be manufactured in a mill by chlorinating milk of lime to give the two soluble products $CaCl_2$ and $Ca(OCl)_2$. In either case a small amount of the total chlorine may be present in the form of less desirable compounds, such as chlorates.

Bleach sludge settles out in the commercial preparation of bleach liquor, because of excess $Ca(OH)_2$ and the insoluble components of the lime. This sludge is usually discarded and a chemical analysis is desirable to determine the amount of chlorine and lime present. Excess $Ca(OH)_2$ may also be present to a greater or lesser degree in the bleach liquor.

Bleaching Powder

Sampling

If the drums or containers are marked with a lot number, ascertain the number of containers of each lot in the shipment. Then take samples from one or more containers from each lot number in approximate proportion to the quantity of containers of each lot number present. The total number of containers sampled shall not be less than 10%, except by previous agreement between buyer and seller. If the containers do not bear lot numbers, sample 10% unless otherwise agreed.

Use a tubular sampler, approximately 12 inches long and ½ inch wide, with a concavity of ¼ inch. Insert the sampler through an opening in the center in the side of each drum three times. The position of the trier upon the first insertion shall be toward the top of the drum; the second in a horizontal position; and the third toward the bottom. Quickly and thoroughly mix the samples thus drawn; cone and quarter in the usual way until reduced to an amount sufficient to fill a 1-quart jar. Keep the jar tightly closed except when withdrawing portions for analysis.

Available Chlorine

Discard the outside, top layer of the laboratory sample to a depth of ½ to 1 inch and then quickly and thoroughly mix the rest of the sample and place a portion in a glass-stoppered weighing bottle. Keep the bottle covered while in the balance case, as chlorine is very corrosive. Accurately weigh about 8 grams from the weighing bottle into a porcelain mortar, add a little water* and rub the mixture to a smooth cream with a pestle. Then stir in more water, let settle for a few moments and pour off through a funnel in a 1-liter volumetric flask about two-thirds full of water. Again rub the sediment with water and pour off as before. Repeat until the entire sample has been conveyed to the flask without loss. Conduct the entire operation rapidly to avoid loss of Cl. Fill the flask to the mark with water, mix well, and pipet 50 ml. into a 250-ml. Erlenmeyer flask immediately, without allowing the material to settle. Add 10 ml. of 20% potassium iodide (KI) solution, mix by swirling, and add 10 ml. of 20% acetic acid. Mix again by swirling and titrate immediately with 0.1 *N* sodium thiosulphate ($Na_2S_2O_3$) solution until the iodine color is almost discharged. Add starch indicator and continue the titration to the disappearance of the blue color. Calculate the percentage of available chlorine on the basis of the original weight of bleaching powder ground up for test.

Calculation:
1 ml. 0.1 *N* $Na_2S_2O_3$ = 0.003546 gram Cl.

Note: Usually the percentage of available Cl is the only determination required for bleaching powder. If desired, for some special case, the prepared sample may be analyzed for total Cl and titratable alkali as under bleach liquor.

Bleach Liquor

Sampling

Agitate the batch thoroughly and withdraw approximately 500 ml. of the liquor. Store in a dark bottle away from light and heat. Analyze as soon as possible.

Available Chlorine

Prepare a test sample by agitating the sample thoroughly, then pipetting 50 ml. into a 250-ml. volumetric flask and diluting to the mark. Pipet 25 ml. of this test sample into approximately 25 ml. of water in a 250-ml. flask. Add 10 ml. of 20% KI solution, mix by swirling and add 10 ml. of 20% acetic acid (*see* note) Mix again by swirling and titrate with 0.1 *N* $Na_2S_2O_3$ solution until the iodine color is almost discharged; then add starch indicator and continue the titration to the disappearance of the blue color. Express results as grams of available chlorine per liter.

* This method has been approved as a tentative standard by the Nonfibrous Materials Testing Committee. Criticisms are earnestly requested and should be sent to R. G. Macdonald, Secretary, Technical Association of the Pulp and Paper Industry, 122 E. 42nd St., New York 17, N. Y. Reprints of this standard may be obtained from the Secretary at 25 cents each.

* Wherever water is required in this method distilled water must be used.

Calculation:
Ml. 0.1 *N* $Na_2S_2O_3$ × 0.7092 = grams available Cl per liter.

Note: If the sample is strongly alkaline, a fading end point may be encountered. This may be overcome by first neutralizing most of the alkalinity with dil. HCl (1:1) and then adding 10 ml. of 20% acetic acid as specified.

Total Chlorine

Agitate the test sample thoroughly and pipet 25 ml. into a 250-ml. flask. Add 3% hydrogen peroxide (H_2O_2) solution until effervescence ceases and then add a few drops of conc. HNO_3. Mix and add chloride-free $CaCO_3$ in slight excess. Add about 0.5 ml. of potassium chromate indicator solution, containing 25 grams of K_2CrO_4 per liter, and boil gently until the lemon yellow color is permanent. Cool to room temperature and titrate with 0.1 *N* $AgNO_3$ to a faint orange tint.

Calculation:
Ml. 0.1 *N* $AgNO_3$ × 0.7092 = grams total Cl per liter.

Note: Care must be taken to add the $CaCO_3$ in slight excess only. This fixes the pH at the optimum condition which, when the end point of the titration is reached, should be approximately 8. Off-color end points are obtained when the pH becomes appreciably higher than this figure.

Chlorate, if present, is not included either in the available or the total Cl determination. The amount is usually small and may be approximately calculated from the difference between the total and available Cl determinations, provided the original chloride content of the lime slurry before chlorination is known. As the latter is usually negligible, it is usually sufficient to calculate the Cl present as chlorate by taking one-fifth of the difference between the available and total Cl determinations. The chemical reaction for the formation of chlorates is:

$$6\ Ca(OH)_2 + 6\ Cl_2 \rightarrow Ca(ClO_3)_2 + 5\ CaCl_2 + 6\ H_2O$$

Titratable Alkali

Agitate the test sample thoroughly and pipet 50 ml. into a 400-ml. beaker containing approximately 100 ml. of water. Add neutral 3% H_2O_2 solution in 0.5-ml. portions until a drop of the contents of the beaker no longer gives a blue reaction with starch-iodide solution (*see* note) on a spot plate. Stir well with a glass rod to release oxygen from the solution. Add a few drops of methyl orange indicator, titrate with 0.1 *N* HCl to a permanent pink color, and then add approximately 5 ml. of 0.1 *N* HCl in excess. Record the total amount of HCl solution used. Back titrate with 0.1 *N* NaOH solution to the first indication of a yellow color. From the difference (HCl consumed) calculate the titratable alkali, in terms of $Ca(OH)_2$. (*See* also under Additional Information.)

Calculation:
Ml. 0.1 *N* HCl consumed × 0.370 = grams titratable alkali per liter.

Note: The starch-iodide solution is prepared as follows:[9] Triturate 1 gram of arrowroot starch with a little cold water and then add with constant stirring 100 ml. of boiling water. Allow to cool and then add 0.25 gram of KI.

Bleach Sludge

Sampling

Agitate the sludge thoroughly and withdraw approximately 500 ml. Since sludge settles rapidly, great care must be taken to obtain a representative sample. Store in a dark bottle, away from light and heat, and analyze as soon as possible.

Available Chlorine

Prepare a test sample as follows: Agitate the sample of sludge thoroughly, then pour quickly into a 100-ml. volumetric flask, filling the flask to the mark. Decant the finest material into a 500-ml. volumetric flask and add the residue, a little at a time, to a mortar. Grind with a pestle and transfer through a funnel to the flask, adding more water as required. Continue until the entire sample is conveyed to the 500-ml. flask without loss, taking care that all lumps are broken up which might plug a wide-orifice pipet. Dilute to the mark with water.

Agitate the test sample thoroughly and, using a wide-orifice pipet, measure out 25 ml. into a 250-ml. Erlenmeyer flask containing 25 ml. of water. Add 10 ml. of 20% KI solution and 10 ml. of glacial acetic acid. Titrate with 0.1 *N* $Na_2S_2O_3$ solution and proceed as for bleach liquor.

Calculation:
Ml. 0.1 *N* $Na_2S_2O_3$ × 0.7092 = grams available Cl per liter.

Total Chlorine

Agitate the test sample thoroughly and with a wide-orifice pipet transfer 25 ml. into a 250-ml. Erlenmeyer flask. Add 3% H_2O_2 until effervescence ceases, then just sufficient conc. HNO_3 to dissolve the acid-soluble components of the sample. Then add a few drops of HNO_3 in excess. Add chloride-free $CaCO_3$ in slight excess and a few drops of K_2CrO_4 indicator solution. Proceed as for bleach liquor.

Titratable Alkali

Agitate the test sample thoroughly and, using a wide-orifice pipet, transfer 50 ml. to a 400-ml. beaker containing approximately 100 ml. of water. Add neutral 3% H_2O_2 solution in 0.5-ml. portions until a drop of the contents of the beaker no longer gives an immediate blue reaction with starch-iodide solution on a spot plate. Stir well with a glass rod to release oxygen from the solution. Add a few drops of methyl orange indicator, titrate with 0.1 *N* HCl to a permanent pink color, and then add approximately 10 ml. of 0.1 *N* HCl acid in excess. Proceed as for bleach liquor.

Additional Information

The procedure given for titratable alkali includes $Mg(OH)_2$ and carbonates of Ca and Mg, although these compounds are usually present only in small amounts. If desired, an alternative procedure may be employed which approximately determines the combined Ca and Mg hydroxides. However, depending on the conditions of manipulation, this procedure may also show one-half the carbonate present, so that results are not capable of precise designation. It is of value in control testing and in special cases.

Agitate the test sample thoroughly and pipet 50 ml. into a 400-ml. beaker containing approximately 100 ml. of water. Add neutral 3% H_2O_2 solution in 0.5 ml. portions until a drop of the contents of the beaker no longer gives a blue reaction with starch-iodide solution on a spot plate. Stir well with a glass rod to release oxygen from the solution, then add a few drops of phenolphthalein indicator and place the beaker under a mechanical stirrer run at moderate speed. Titrate slowly with 0.1 *N* HCl to complete disappearance of the pink color, continuing the stirring throughout the entire titration.

Calculation:
Ml. 0.1 *N* HCl × 0.37 = grams of titratable alkali per liter [in terms of $Ca(OH)_2$].

Literature Cited

1. Bunn, C. W., Clark, L. M., and Clifford, I. L., "The Constitution and Formation of Bleaching Powder," *Proc. Roy. Soc.* (London) A151:141-67 (1935).

Issues Directory of Chemists

The ninth edition of the "Classified Directory of Consulting Chemists and Chemical Engineers," has just been published by the Association of Consulting Chemists and Chemical Engineers, Inc., 50 East 41st street, New York 17, N. Y.

The directory contains 108 pages and lists a large increase in membership here and abroad. Section 1 contains a key sheet and index, listing about 100 fields of chemistry and engineering. Section 2 consists of scope sheets of members, describing their qualifications and field of their activities. Section 3 consists of indexes, facilitating reference to the concerns with which the members are associated.

Sodium Peroxide Bleaching of Mechanical Pulps*

By J. S. Reichert[1]

Abstract

Research and development work on the sodium peroxide process for bleaching mechanical pulps has reached the practical stage. Paper mill operations show that bleached groundwood can be used with technical and economic advantages in the manufacture of a wide range of papers.

In a typical operation of the process, unbleached groundwood from the deckers is delivered at a constant consistency and a measured rate into a mixer where it is mixed with the bleaching solution in controlled proportions. The bleaching solution is prepared by dissolving sodium silicate and sodium peroxide in water and adding enough sulphuric acid to adjust the solution to the proper alkalinity. Small amounts of Epsom salt are mixed with the bleaching solution and also with the pulp slurry to stabilize the bleaching action. The peroxide treated pulp passes continuously through a tower or is retained in a series of holding tanks; here the bleaching action goes to completion. The bleached pulp is neutralized and the traces of residual peroxide are reduced by a treatment with sulphite cooking acid. The bleached and neutralized pulp is ready for delivery to the beater supply chest for use in the paper machine furnish.

Conservation of pulpwood and elimination of the waste disposal problem are important economic considerations in connection with the production of papers from bleached groundwood. The chemicals cost for increasing the brightness of groundwood 10 points (G.E.) is approximately $6.00 per ton (air-dry basis). The cost of an installation for bleaching groundwood at a rate of 50 tons per day is estimated at $90,000 to $100,000.

Substantial savings in fiber costs are realized by using bleached groundwood for producing papers in which brightness, cleanliness, bulk, opacity, absorbency, and printing properties are of major importance and in which high strength and a long useful life are secondary considerations. Savings of 10 to 20% in fiber costs are obtainable in the production of many kinds of paper; in some types of papers the savings are as high as 40% of the total fiber cost. These savings are based principally on two factors: (a) lower cost of fiber and (b) same opacity obtained with a lighter weight sheet.

Research and development work on the sodium peroxide (Solozone) process for bleaching mechanical pulps has reached the practical stage. Paper mill operations show that bleached groundwood can be used with technical and economic advantages in the manufacture of a wide range of paper products. This paper summarizes the technical information available on this process.

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Member TAPPI; Manager, Peroxygen Products Development, Electrochemicals Dept., E. I. du Pont de Nemours & Co., Inc., Niagara Falls, N. Y.

The outlook on the availability of sodium peroxide and other peroxygen compounds for pulp bleaching is not favorable and is not expected to improve for the duration. Peroxides are being allocated by the War Production Board and, for the immediate future, they will most likely be available only for highly critical war uses.

Bleaching Process

Operation

The sodium peroxide process for bleaching mechanical pulps includes the following operations:

1. Rapid and thorough mixing of the sodium peroxide bleaching solution with the pulp in controlled proportions.
2. Storing the peroxide treated pulp long enough to permit bleaching to go to completion.
3. Treating the peroxide bleached pulp with a neutralizing and reducing agent, such as sulphite cooking acid.

In a typical operation of the process, unbleached groundwood from the deckers or vacuum thickener is delivered at a constant consistency and a measured rate into a mixer where it is mixed with the peroxide bleaching solution in controlled proportions. The bleaching solution is prepared by dissolving sodium silicate and sodium peroxide in water and adding enough sulphuric acid to adjust the solution to the proper alkalinity. Small amounts of Epsom salt are mixed with the bleaching solution and sometimes also with the pulp slurry to stabilize the bleaching action.

The peroxide treated pulp passes continuously through a tower or is retained in a series of holding tanks; here the bleaching action goes to completion.

The bleached pulp is neutralized and the traces of residual peroxide are reduced by a treatment with sulphite cooking acid. The bleached and neutralized pulp is ready for delivery to the beater supply chest for use in the paper machine furnish.

Equipment

In the selection of tanks, pumps, mixers, agitators, and control instruments for operating the process, the existing facilities and floor plan in a specific mill must receive consideration. The diagrammatic layouts of equipment have been shown *(15)* and are functional and illustrative; other types of installations may be expected to give satisfactory results as long as the equipment is designed to maintain the conditions which are essential for good bleaching results. It should be emphasized that the process is new and therefore improvements in equipment and operation are to be expected.

Structural Materials

In the choice of structural materials for operating this process the following factors require consideration: (1) resistance to corrosion, (2) catalytic effect on peroxide decomposition, and (3) pulp discoloration.

Iron and steel, rubber-lined iron and steel, stainless steel, wood, concrete, transite, tile, tile-lined concrete, rubber, and lead may be used as materials for the

construction of the particular items of equipment for which they are specifically recommended.

Lead is a very active catalyst for peroxide decomposition and must be avoided in equipment which comes into contact with the peroxide bleaching solution or with the peroxide treated pulp prior to completion of the bleaching treatment.

Copper and copper alloys are not suitable for equipment which comes into contact with the peroxide bleaching solution or with the peroxide treated pulp while bleaching is in progress since copper is also an active catalyst for peroxide decomposition. Entry of copper into the pulp and into the mill waters prior to the bleaching treatment, should be avoided or kept to the minimum practical figure.

Iron is also a catalyst for peroxide decomposition, though not as active as lead and copper. In mills where the pulp or mill waters are abnormally hign in acidity, iron equipment is subject to corrosion. Dissolved iron will cause a reversion in pulp brightness and will have an adverse effect on bleaching efficiency. Iron is not recommended for equipment which comes into contact with the bleaching solution. Iron is not a preferred structural material for use in contact with peroxide treated pulp while bleaching is in progress though ordinary iron gives fair performance for this operation if coated with silicate or other corrosion resistant material.

Transite, tile, wood, and stainless steel are free from the objections which are inherent in lead, copper and, to a somewhat lesser degree, in iron.

Pulp Yields

Quantitative laboratory studies on the recovery of stock in the bleaching process show little or no weight loss, i.e., less than 1%. Yields in mill operations have not been determined with a high degree of accuracy; however, checks on plant inventories over extended periods of time have indicated yields comparable to those obtained in the laboratory.

Species of Wood Bleached

Spruce, balsam and poplar are known to react favorably to bleaching with sodium peroxide.

Fields of Application

Mechanical pulps, with their high bulk, good opacity, uniform sheet formation, good printing properties, and low costs, are particularly applicable where a short fiber is desirable, where extraordinary strength is not essential, and where an exceptionally long life is not required. Bleached groundwood can be used with technical and economic advantages in the production of a range of papers such as book, magazine, catalog, directory, mimeo, tablet, tissue and towelling, and a number of specialty papers.

Characteristics of Bleached Groundwood

Brightness

Improvement in brightness is the outstanding result of the bleaching treatment. The brightness increase obtained in bleaching depends on a number of factors, such as color of the unbleached pulp, species and condition of the wood, and percentage of sodium peroxide used in bleaching. The brightness increases obtained by bleaching groundwood with increasing amounts of sodium peroxide at 90°F. and a 5% consistency are approximately as follows:

% Sodium Peroxide	Points Increase
1.0	6-7
1.5	8-9
2.0	10-11

With groundwood at a higher brightness level, it is possible to include a substantial percentage of groundwood in a paper furnish and still maintain a satisfactory brightness.

Stability

The stability of groundwood to sunlight or the ultraviolet lamp is not improved to an appreciable degree by the bleaching treatment. Stored away from light the bleached product is fairly stable; a drop in brightness from 67.2 to 66.4 was observed in a storage test of over 2 years.

The loss of 2 to 3 points in brightness, usually observed over the paper machine with unbleached groundwood, is normally not encountered with bleached groundwood.

Opacity

Since the bleaching treatment removes color from the pulp, a decrease in opacity might be expected corresponding to the normal correction on opacity for differences in brightness. Beeman and his co-workers *(2)* found this to be true, however, only to a slight degree; they report that the opacity of groundwood is very nearly the same before and after bleaching.

High percentages of bleached groundwood can be used in furnishes to produce papers in which the properties of high opacity and high brightness are combined. Rhodes *(18)* reports that a 62 pound sheet containing 60% bleached groundwood has the same opacity as a 75 pound free sheet.

Bulk

The bulking properties of groundwood are not changed by the bleaching treatment.

Strength

The strength of groundwood is not increased or impaired by the bleaching treatment. However, data on paper strengths indicate a slight trend toward increased strength with the bleached pulp. This may be caused by the greater uniformity in sheet formation.

Freeness

Groundwood gives about the same results in freeness tests before and after bleaching. While the freeness of groundwood is not improved by bleaching, nevertheless, the working properties are better and the drainage rate on the paper machine is higher with the bleached pulp.

Formation

Bleaching "mellows" the pulp and gives improved formation on the machine. The finished paper has a smoother and more velvety feel and does not show the harshness frequently associated with unbleached groundwood sheets. It has less fuzz and lint; it is more homogeneous and is finer in texture than book grades made with unbleached groundwood.

Cleanliness

Fiber bundles and dirt specks present in unbleached groundwood are softened and largely disappear in the bleaching treatment. Tanks, pipe lines, and other equipment used in the bleaching operation are free from slime growth; dirt from this source is eliminated.

Absorbency

The absorbency toward oil is high and rapid. When inks dry by absorption this is a valuable property, e.g., in a high speed rotary letter-press and in mimeograph paper where good absorbency, coupled with body and opacity are particularly desirable.

Water absorbency and retention of water absorbency with age are improved by bleaching. This prop-

erty is desirable in tissue, towelling, and allied products.

Printing Properties

Groundwood has a resilience which permits uniform printing at lower pressures; this property is enhanced somewhat by the bleaching treatment. In the bleached groundwood sheet the hills and valleys print out uniformly and at lower pressures than are required to reach into the low spots of a free sheet.

Economic Considerations

Conservation of Pulpwood

In the production of groundwood the fiber yields are high (about 95%) and the weight loss in the sodium peroxide bleaching process is low (1% or less). Use of groundwood in paper manufacture, therefore, provides a means for converting pulpwood into paper with a minimum loss of fiber.

The loss of fiber in the production of chemical pulps varies somewhat with the nature of the processing; an additional loss is incurred in bleaching. In the conversion of pulpwood into chemical fiber the yields are in the range of 45 to 50% for unbleached pulps and somewhat below this figure for bleached pulps.

In the production of fiber from pulpwood for paper manufacture, the yields of groundwood are approximately double the fiber yields obtained in the chemical pulping processes.

Waste Disposal

Disposal of waste products constitutes a major problem in the production of sulphite pulps; the liquor from the digestors contains about half of the weight of the pulpwood. Waste disposal is a negligible problem in groundwood production.

Bleaching Costs

The following cost estimates should be considered as approximations. They are based largely on laboratory data, confirmed to some degree by experimental plant runs and in a limited way by mill operations.

The cost of chemicals for bleaching groundwood is about $3.80 per ton (air-dry) for a 6 point increase in brightness, and about $6.70 per ton (air-dry) for a 10 point increase in brightness.

With brightness increases of 6 to 10 points in the pulp, the chemicals cost per ton per point increase in brightness is in the range of 64 to 67 cents per ton (air-dry).

The cost of chemicals per ton of paper, for bleaching the groundwood content of a paper produced from 50% bleached groundwood, 40% sulphite pulp and 10% clay, ranges from about $2.00 per ton for a 5 point increase in brightness to approximately $5.35 per ton for a 9 point increase in brightness.

The cost of chemicals per ton of paper per point increase in paper brightness, for bleaching the groundwood content of the furnish described in the preceding paragraph, ranges from 38 to 60c per ton with brightness increases of 5 to 9 points. Obviously, these cost estimates will vary with the composition of the paper machine furnish.

Equipment Costs

The cost of an installation for bleaching groundwood at a rate of 50 tons per day is estimated at $90,000 to $100,000.

Savings in Paper Manufacture

Substantial savings in fiber cost are realized by using bleached groundwood for producing papers in which brightness, bulk, opacity, absorbency, and printing properties are important and in which high strength and a long useful life are not so essential. The principal savings are based on: (a) lower cost of fiber, and (b) same opacity obtained in a lighter weight sheet. Savings of 10 to 20% in fiber costs are obtainable in the production of many kinds of papers; in some types of furnishes the savings are as high as 40% of the total fiber cost.

Definition of Terms

Quantities of groundwood are expressed on the air-dry basis, i.e., 90 pounds of moisture-free pulp is equivalent to 100 pounds air-dry pulp.

Percentages of chemicals used in the bleaching process refer to pounds of chemicals per 100 pounds of air-dry pulp, e.g., 1.8% sodium peroxide means 1.8 pounds sodium peroxide per 100 pounds air-dry pulp; this is equivalent to 2 pounds sodium peroxide per 100 pounds moisture-free pulp.

Consistency is expressed as pounds of moisture-free fiber per 100 pounds of stock, e.g., 5% consistency means 5 pounds of moisture-free fiber per 100 pounds of stock.

Pulp brightnesses are expressed in terms of units as determined with the General Electric reflection meter (brightness tester).

Chemicals

The chemicals used in the bleaching process are sodium peroxide, sodium silicate, sulphuric acid, magnesium sulphate and a reducing and neutralizing agent, such as sulphite cooking acid, sodium bisulphite, sodium metabisulphite, sodium thiosulphate, or sulphur dioxide.

Sodium Peroxide

This chemical is a dustless, free-flowing, pale yellow, granular solid. It is an alkaline bleaching agent containing 20% active oxygen, stable at ordinary temperatures when kept dry in air-tight containers. With proper technique it can be dissolved in water with little or no loss of active oxygen.

Sodium peroxide is the active bleaching agent in the process. Although the complex chemical reactions which take place in the bleaching process are not completely understood, the primary reaction is probably a selective oxidation and decolorization of the traces of organic coloring matter naturally present in the wood. The amount of sodium peroxide used in the bleaching process may be varied to produce different degrees of bleaching. The most practical range appears to be 1.0 to 2.0%, with resulting brightness increases in the range of 6 to 11 G.E. units.

Other peroxygen compounds, such as hydrogen peroxide and sodium perborate, give bleaching results comparable to those obtained with sodium peroxide. In bleaching with hydrogen peroxide no sulphuric acid is required but an additional amount of alkali must be supplied, e.g. caustic soda, sodium silicate, or some other alkaline material. In the choice of a peroxygen compound, or of a combination of peroxygen compounds for groundwood bleaching, the cost per unit of active oxygen is the principal factor.

Sodium Silicate

For use in this process sodium silicate should be water-white and free as possible from heavy metal impurities; it should have no adverse effect on the stability of peroxide solutions. Since sodium peroxide and sodium silicate together supply more than the amount of alkali required for the process, the

value of the silicate lies principally in its SiO_2 content rather than in its Na_2O content.

Sodium silicate has the properties of a detergent and a penetrant. It buffers the bleaching solution and aids in maintaining the pH in the desired range. It forms a protective coating on the surface of metals and inhibits corrosion of metal equipment. It also has a stabilizing action on peroxide solutions under the conditions which prevail in the pulp bleaching process.

The optimum amount of 41.5°Bé silicate used in the bleaching process varies with the pulp consistency and the bleaching temperature and is in the range of 4.0 to 10.0%.

Sulphuric Acid

A clear, colorless grade of 66°Bé sulphuric acid is preferred; this chemical is shipped in 200-pound glass carboys, drums, and in tank car lots.

For good bleaching results the total alkali content of the bleaching solution must be controlled within proper limits. Sodium peroxide and sodium silicate are alkaline; in general, part of the alkali introduced into the bleaching solution by these chemicals must be neutralized with sulphuric acid.

The amount of sulphuric acid used in the bleaching process varies with the percentage of sodium peroxide used and with the pulp consistency. With 1.8% sodium peroxide and a pulp consistency of 5%, the preferred amount of sulphuric acid is approximately 1.5%.

Other acids or acid salts may be used instead of sulphuric acid provided they do not react with peroxide.

Magnesium Sulphate

This chemical is available as the hydrated crystalline salt ($MgSO_4.7H_2O$—Epsom salt) and as the anhydrous salt. Epsom salt contains very nearly half as much magnesium sulphate as the anhydrous salt.

Magnesium sulphate has a remarkable stabilizing effect on alkaline peroxide solutions under the conditions which prevail in the pulp bleaching process. It performs this function by inhibiting the catalytic effects of the traces of metals, particularly iron, copper, and manganese, which are commonly present in pulpwood and in mill waters.

The stabilizing effect is obtained with small amounts of magnesium sulphate, e.g., 1 pound Epsom salt per 500 gallons added to the bleaching solution and about 10 pounds per ton of pulp added to stock before it is mixed with the bleaching solution.

Neutralizing and Reducing Agent

The most convenient and economic material for use in the neutralizing and reducing treatment in the final stage of the process is sulphite cooking acid particularly in mills which produce both groundwood and sulphite pulps. The sulphite cooking acid should be low in heavy metal content and should be free from organic coloring matter, dirt, and sludge; it is desirable to remove any colored solids from the sulphite cooking acid used in acid with a small sand filter. The sulphite cooking acid used in the development of this process contained approximately 6.5% total (free + combined) sulphur dioxide.

Sulphite cooking acid has several desirable effects in the final stage treatment of the bleached pulp. It neutralizes the small amount of alkali remaining in the pulp at the end of the sodium peroxide bleaching step and lowers the pH of the pulp to the desired value. It reduces to the colorless ferrous form the traces of highly colored ferric iron normally present in the bleached pulp. It also destroys the trace of peroxide remaining in the pulp and prevents the development of a pink color which frequently results when unbleached sulphite pulp is mixed in the beater with bleached groundwood containing traces of residual peroxide.

In case sulphite cooking acid is not available, other reducing agents may be used. Sodium bisulphite, sodium metabisulphite, sodium thiosulphate, sodium hydrosulphite, zinc hydrosulphite, or sulphur dioxide will function satisfactorily as the reducing agent. When bisulphite or thiosulphate is used, it may be necessary in some instances to use an acidic material, such as sulphuric acid or alum, for lowering the pH to the desired value.

Safety Considerations

With equipment properly designed for handling sodium peroxide, this operation can be carried out with safety. However, sodium peroxide is an active oxidizing agent and *in the dry state* must not be allowed to come in contact with oxidizable materials such as organic matter in the form of pulp, sawdust, starch, cloth, etc. Sodium peroxide should be stored in the original containers in a dry, fireproof location, away from flammable and combustible materials. In case the container of sodium peroxide is not all used at one time, the partially emptied container should be kept tightly covered; when emptying a container the sodium peroxide should be removed completely. Sodium peroxide accidentally spilled should be covered with liberal quantities of soda ash; the mixture of sodium peroxide and soda ash should be shoveled into a pail, dissolved in water and poured down the sewer. Goggles and rubber gloves should be worn by operators when sodium peroxide, sodium silicate, sulphuric acid, or solutions of these compounds are handled. If these chemicals come in contact with the skin, they should be washed off immediately with large quantities of water, e.g., in a safety shower.

Consideration of Variables in the Bleaching Process

In some instances the information on the importance of variables in the bleaching process is still meager; considerable progress has been made in the study of other variables. From the work so far it is evident that some of the variables are interdependent; i.e., a change in one variable necessitates a change in one or more other variables.

The following variables are under consideration and, subject to further confirmation, the following trends are indicated:

Species of Wood Used in Grinding

Bleachability appears to vary somewhat with the different species of woods. Spruce, balsam, and poplar are giving satisfactory results in commercial bleaching operations. A study of the bleachability of other species of wood is in progress. There are some indications that a relationship may exist between the pitch content of the wood and its reaction to sodium peroxide bleaching.

Source of Wood

Wood of the same species but grown in different localities has shown small differences in bleaching results.

Aging of Wood Before Grinding

Bleaching studies on pulps prepared from freshly

cut wood and from the same type of wood after aging are not conclusive. Other important variables may have entered into these experiments to obscure the results.

In some instances bleaching of mechanical pulps is affected favorably by a pretreatment, either of the pulpwood before grinding or of the pulp before bleaching. Oak and hemlock groundwoods react more favorably to sodium peroxide bleaching when the pulp is given an alkaline pretreatment. Mechanical pulps produced from some species of woods, such as birch, respond favorably to peroxide bleaching when the pulpwood is given a mild chemical pretreatment; in this connection pretreatments with an acid or an alkali, and/or a reducing agent, and/or steam or hot water, and/or a wetting agent or a penetrant are of interest. Use of peroxide in alkaline pretreatments may be expected to prevent the excessive alkali reversion in color which normally occurs when wood is softened by an alkaline treatment to improve the fiber characteristics of the resulting groundwood.

Fineness of Grinding

No marked differences in bleaching results have been observed with pulps ground to different degrees of fineness. It is possible that finely ground pulp will bleach in a shorter time than coarsely ground pulp but this conclusion is not definite.

Aging of Groundwood Before Bleaching

In general, somewhat greater brightness increases are obtained when the pulp is bleached immediately after grinding. However, good bleaching results have been obtained with pulps stored for six months and longer. Development of bacteria and molds, souring, and spoilage of pulp during storage is accompanied by less favorable bleaching results.

Pulp Consistency

Consistency is an important factor in the bleaching operation. In the consistency range of 3.0 to 7.0% the brightnesses obtained in bleaching with the same amount of sodium peroxide, are higher at the higher consistency. In preliminary laboratory studies a small additional increase in brightness was obtained at consistencies up to 15%. Further consideration is being given to the effect of high consistencies on the brightnesses obtained in bleaching.

The bleaching time decreases with increases in consistency; at a bleaching temperature of 90°F. the following trend is indicated with 2% sodium peroxide: 8 to 9 hours at 3.5% consistency, 5 to 6 hours at 5.0% consistency and about 2 hours at 15% consistency.

A study of heat balances in the groundwood system shows that, when the white water from the deckers is returned to the grinders, the temperature at which the pulp is delivered to the bleaching process increases with consistency. If ordinary measures are taken to prevent heat losses, the pulp temperature will be 90°F. or higher when the consistency is maintained at 5% or higher. Lower temperatures may be encountered in cold weather during the start-up period or when the pulp is pumped through exposed lines over long distances out-of-doors. In such cases the pulp or the white water should be heated with steam to raise the pulp temperature to about 90°F.

Bleaching at high consistencies has interesting possibilities also from the standpoint of decreasing the size of the bleaching equipment. A study of the density of groundwood (pounds fiber per cubic foot) at different consistencies (0 to 50%) in towers of different heights is in progress. The trend of the data indicates practically a straight line relationship between density and consistency at consistencies up to about 15%. At higher consistencies, i.e., when the interstices between the fibers are no longer filled with water, little or no further increase in density has been observed. The packing effect on bulk density in towers of different heights also becomes a more important factor at these higher consistencies.

The economic factors in connection with bleaching at different consistencies may be summarized briefly as follows: Bleaching at higher consistencies requires more dewatering equipment and involves higher costs for dewatering. Mixing the bleaching solution with the pulp becomes more difficult, though possible with available equipment at consistencies above 5%. The factors favoring higher consistencies are a smaller bleaching tower or retention tanks, because of the higher bulk density of the pulp and the shorter bleaching period, and use of little or no steam to maintain higher temperatures.

Quality of Water

Water of good quality is an important factor in the production and bleaching of mechanical pulps and also in the conversion of the pulps into paper. Good water is a particularly important factor in the production of bright papers. Colored or color-producing impurities, such as the highly-colored iron compounds, cause substantial drops in pulp and paper brightnesses. Decreases of 1 to 9 points in brightness have been observed under adverse water conditions. This subject is covered more fully by Miller *(12)* in a report of the Water Committee of TAPPI.

Many of the heavy metals, particularly iron, copper, and manganese have a catalytic effect on the decomposition of peroxide. These metals, normally present in pulpwood and in mill waters, may be in an active form or they may be chemically combined with other constituents of the wood or water in an inactive form. The traces of catalytic metals in pulpwood are comparatively inactive; they are probably tied up as undissociated complexes with organic compounds in the wood; also, their catalytic activity is inhibited by the stabilizing compounds of magnesium and calcium compounds present in the pulpwood. The catalytic metals in the mill waters are likely to be in an active form and are more apt to have an adverse effect on the bleaching results, unless steps are taken to deactivate them. Deactivation of these metal catalysts may be accomplished by the addition of magnesium sulphate to the bleaching solution, to the pulp, or to both. More detailed information on the control of metal catalysts has been given *(7)*.

Bleaching Conditions

Proper proportioning of the chemicals in the preparation of the bleaching solution, as well as proper proportioning of the bleaching solution with the pulp in the bleaching treatment, have an important bearing on the bleaching results *(16)*.

Temperature has a marked effect on the rate of bleaching and on the brightnesses obtained in bleaching. Good bleaching results have been obtained in commercial operations at temperatures of 70 to 120° F. In this temperature range the bleaching time decreases with a rise in temperature. Preliminary laboratory results show a trend in the direction of a considerable increase in rate of bleaching at temperatures above 120°F.

Preliminary results obtained in a study of the neutralizing and reducing treatment in the final stage of the bleaching process. indicate that with good mixing the reaction is completed in a very short time. In general, a time of 1 to 2 hours has been found adequate, though there have been instances when a longer storage time resulted in a somewhat higher brightness. When sufficient sulphite cooking acid is added to the bleached pulp to lower the pH to the desired value, there is generally enough cooking acid present to complete the required reducing action.

The published literature on the peroxide bleaching of mechanical pulps is not extensive. The earliest reference found was a German patent *(5)* issued in 1905; a corresponding U. S. patent *(6)* was issued in 1907; the process disclosed in these patents is multistage and includes bleaching with sodium peroxide and chlorine. Robinson *(19)*, in a U. S. patent issued in 1927, describes a treatment of mechanical pulps with sodium peroxide for the purpose of achieving a more complete separation of the fibers and the formation of a stronger, tougher, cleaner, and more uniform paper. Curran, Schafer, and Pew *(4)*, in a paper presented at the TAPPI meeting in 1934, reported the results of studies on groundwood bleaching at the Forest Products Laboratory. Their investigations included both oxidizing agents and reducing agents. They found the oxidizing agents, particularly alkaline peroxide, more effective than the reducing agents for bleaching mechanical pulps. Heritage *(8)*, in a U. S. patent issued in 1938, describes a rapid, high temperature bleach with hydrogen peroxide made alkaline with sodium silicate; he reports a marked increase in brightness and also a material increase in color permanence with less fading on exposure to heat and light. Kauffmann *(9)* in a U. S. patent issued in 1939, describes a process for the peroxide bleaching of wood pulps at high consistencies. Craig *(3)*, in a U. S. patent issued in 1940, describes a two-stage groundwood bleaching process, first with alkaline peroxide and then with sulphurous acid or an acid sulphite. Other U. S. Patents *(13, 14)* refer to the sodium peroxide bleaching of mechanical pulps under controlled conditions of temperature and alkalinity. A publication by the National Bureau of Standards *(21)* in 1942 reports an improvement in the stability of groundwood to light due to bleaching with sodium peroxide. At a meeting of the Empire State Section of TAPPI in 1943, Beeman *(1)* presented a paper describing briefly the sodium peroxide bleaching of mechanical pulps, the properties of the bleached pulps and the applications of the bleached pulps in paper manufacture.

In a symposium on the "Sodium Peroxide Bleaching of Mechanical Pulps" at the annual meeting of TAPPI in 1944, a status report on this development was presented in a series of seven papers on different phases of the subject *(2, 7, 15, 16, 17, 18, 20)*.

A publication *(11)* entitled "St. Regis Successfully Bleaches Groundwood" by J. A. Lee, editor of Chemical and Metallurgical Engineering, describes the operation of the groundwood bleaching process at the Norfolk mill of the St. Regis Paper Company.

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The Problem of Ground Water Usage and Its Effect on Total Local Supply*

By Lewis B. Miller[1]

Abstract

Ground water is one of our most valuable natural resources. Its excessive use and frequent wastage has resulted in local shortages, frequently resulting in curtailment of industrial operations or complete plant shut-downs. Examples are given of the methods used to solve water shortage problems in some of these cases. Water shortages can usually be avoided by proper conservation measures.

In our prodigal American way we have considered surface and ground water supplies capable of providing an unlimited and inexhaustible supply of water for all present and future needs. Local and wide spread droughts have forcibly demonstrated that the water in streams and lakes may be seriously depleted or may vanish entirely during periods of low rainfall, causing water shortages in municipalities and the shut down or curtailment of operations in industry. Experience in the dust bowl and elsewhere shows clearly what may happen to the waters present in the soil during drought periods where unsuitable methods of farming and grazing are employed over a period of years. The present international crisis has caused a concentration of population and a tremendous growth of industry in local areas. In many cases the water supply for both sanitary and industrial uses has been drawn from ground water supplies (as distinguished from the water present in surface bodies such as streams or lakes and from water more or less strongly held by the soil). Industries already present in such areas have increased production to the limit. The result has been an unprecedented use of ground water drawn from

* Presented by title at the Annual Meeting of the Technical Association of the Pulp & Paper Industry, Hotel Commodore, New York, N. Y., Feb. 19-22, 1945.

[1] Chairman, TAPPI Water Committee; Chem. Eng., Consulting Div., W. H. and D. D. Betz, Philadelphia, Pa.

wells in the areas in question. The great increase in air conditioning and humidification installations has placed an added strain upon ground water supplies, since such installations normally cannot use the warmer surface supplies during hot weather but must draw a supply of cool water from wells. This is a usage which will increase greatly during the post-war period.

Depletion of Supply

This increased ground water usage has resulted in the depletion of water supplies locally. The Louisville, Kentucky, area has been threatened with serious difficulties. Houston, Texas, parts of Long Island, New York, Southern California, several New Jersey sections, the coastal area in the Carolinas, and Mill Creek Valley near Cincinnati are some of the areas which have suffered in this respect. In some of these areas it has been necessary to substitute for or to augment present local water supplies at considerable cost.

It has been amply demonstrated that ground water supplies can be seriously reduced and this introduces the main point of the present paper. The pulp and paper industry is a very large user of water which is frequently drawn from ground water sources. It is of the greatest importance, particularly where the pulp or paper plant is located in an area where the subsurface supply may become critical, to conserve the water supply by every reasonable means. If a pulp or paper company plans the construction of a new plant in an unfamiliar area it is of the utmost importance that an early survey of the water supply be made in order to insure an adequate supply of suitable quality and that the mill be so designed as to insure that water usage will be kept at a minimum, compatible with proper mill operation.

Ground Water Replenishment

Ground water supplies are, in general, replenished by local rainfall and snowfall. Extended periods of drought will cause a fall in the water table. Other factors such as deforestation, improper farming, and grazing methods, etc., may also tend to reduce the quantity of ground water by deflecting rainfall into surface supplies. The importance of ground water has been recognized and is being made the subject of study by the Federal Government. Since 1935 observations on water levels and artesian pressures have been made by the U. S. Geological Survey upon a large number of observation wells located throughout the country. For this purpose the United States has been divided into six areas. The latest published data are for 1942. *(1, 2, 3, 4, 5, 6)*. In general, where an area is not subjected to heavy pumpage the ground water levels are found to vary with local precipitation although a number of other factors also affect the ground water supply.

During 1944 precipitation was abnormally low in the northwestern United States and somewhat low in a central area covering Michigan, Indiana, Ohio, Missouri, Kentucky, and Tennessee, and in parts of New England. Heavy precipitation characterized the areas from Kansas north to Manitoba and from Texas east to Florida *(7)*. This affected both the surface and the ground water supplies accordingly. In general, ground water levels were above normal in the North central and Rocky Mountain States, below normal in the Southern and Eastern States.

In addition to the natural method of replenishing the ground water supply through precipitation, local areas have achieved ground water replenishment through engineering means. In Louisville, Kentucky, serious ground water depletion resulted from greatly increased usage of cooling water by distilleries manufacturing alcohol for the synthetic rubber industry. To replenish the ground water supply, cold water was purchased from the city during the winter season and was injected directly through wells into the underground reservoir to be stored for summer use *(8, 9)*. Fortunately the underground reservoir at Louisville is of such a nature as to permit such storage since it consists of coarse Pleistocene glacial deposits partially filling a limestone valley. The water thus stored is more or less permanently retained until again required. This illustration is sufficient to indicate the lengths to which it is necessary to go in individual cases in order to augment natural ground water supplies.

There is a serious objection to injecting water into an aquifer which may be used for potable purposes; this is the possibility of contaminating the aquifer if the water injected is not sterile. In general it would be undesirable for pulp or paper mills to attempt to inject recovered process water into wells because of the probability of soon plugging the porous water bearing stratum with the suspended solids present and because of the polluting nature of such waters. In the writer's experience only one paper mill has attempted to dispose of process water in this way with the result that the porous aquifer soon became plugged.

At Sparrow's Point, Maryland, the ground water supply of the Bethlehem Steel Company was overpumped to the point where it was no longer capable of supplying water for the production needs. The supply was augmented by purchasing large quantities of the treated sewage effluent from the Baltimore sewage treatment plant, under definite quality specifications, to be used for process use. This is one new and unique solution to a process water shortage. Others of equal interest might be quoted. All of these examples serve to illustrate the shortage of ground water existing at certain locations and the need for conservation wherever possible.

Paper and pulp mills offer many *(10)* opportunities for water conservation and all such opportunities should be embraced both as a matter of general conservation of a valuable raw material and because of their immediate economic aspects.

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Delaware Valley Discusses Pollution

The Delaware Valley Section of the Technical Association of the Pulp and Paper Industry met at the Engineers Club, Philadelphia, Pa., on Friday evening, April 6, 1944. A. M. L. Bixler of the Riegel Paper Corporation presided as chairman.

C. M. Connor, reporting for the Nominating Committee announced the slate that will be presented to the members for mail ballot: Chairman—A. M. L. Bixler, Vice Chairman—John Macadam, National Vulcanized Fibre Company, Yorklyn, Del., Vice Chairman—Kingdon Watt, Curtis Paper Company, Newark, Del., Secretary-Treasurer—Lois V. Hans, Hercules Powder Company, Wilmington, Del., Executive Committeemen—F. W. Brainerd, Scott Paper Company, Chester, Pa., and Edw. J. Albert, Thwing-Albert Instrument Company, Philadelphia, Pa.

The principal speaker was Thomas E. Brookover, Downington Paper Company, Downington, Pa., who talked on "A Paperboard Mill's Attack on Stream Pollution." This paper was published in the *Paper Trade Journal* on March 8, 1945.

Those present were: Edward J. Albert, D. A. Beiswinger, A. L. M. Bixler, Alan R. Boyd, Samuel M. Bratton, H. C. Brill, R. S. Brookover, T. E. Brookover, Irvin Brown, L. K. Burnett, Charles W. Carr, Jr., John Carson, T. M. Chemerys, C. M. Connor, Thage Dahlgren, Walter Dempsey, George H. Detwiler, J. C. Dieffenderfer, W. P. Dohne, J. Edge, Harry T. Edwards, H. J. Farra, Jeanne H. Fisher, E. A. Georgi, George J. Gillespie, E. N. Glaum, Philip H. Goldsmith, J. Good, Ralph E. Green, Lois V. Hans, E. A. Hanna, J. C. Harper, Jr., Harry Hulmes, Wm. Y. Irwin, V. Jacobsen, L. T. Kratz, Willard H. Lepp, Lt. R. H. Lippincott, George Lord, J. Macadam, R. G. Macdonald, Geo. B. Martin, Louise E. McGrath, Alex. McInnes, Edward C. Molin, Carroll H. Mullen, Louis Newman, J. F. Ohlson, J. A. Paciello, John Peters, Joseph E. Plumstead, Homer F. Ray, John F. Reardon, A. W. Redlin, E. H. Rice, C. J. Ryder, J. Carl Schmidt, Edw. A. Shallcross, Chas. A. Shubert, Mildred H. Simon, L. Jay Smith, H. L. Springer, Jr., Howard H. Street, Geo. M. Suydam, Richard N. Temple, G. Ray Tomlinson, T. N. Toovey, Wm. O. Ulanhill, A. H. Webber, John P. Weidner, and Wesley O. Wilkinson.

TAPPI Notes

Aubrey N. Dunn, formerly of the American Coating Mills, Inc., is now plant engineer for S. C. Johnson & Son, Inc., Howe & 16th street, Racine, Wis.

H. Wyatt Johnson, formerly of the Canadian Forest Products Laboratory is now manager of Sutherland Refiner, Ltd., 319 Drummond Building, Montreal, P. Q.

Arthur C. Dreshfield, formerly of the Hercules Powder Company is now chemical engineer for the H. P. Smith Paper Company, Chicago, Ill.

The TAPPI New England Section will meet at the Roger Smith Hotel, Holyoke, Mass., on Friday evening, April 20, 1945.

The TAPPI Hudson River Group, Empire State Section, will meet at the Queensbury Hotel, Glens Falls, N. Y., on Friday evening, April 20, 1945.

The TAPPI-New Hampshire Group will meet at the Elmwood Hotel, Waterville, Maine, on May 11, 1945.

Kalamazoo TAPPI Discusses Beating

The April meeting of the Kalamazoo Valley Section of the Technical Association of the Pulp and Paper Industry was held on the evening of the 5th at the Columbia Hotel in Kalamazoo. Following the dinner served in the Crystal Room a general discussion of the beating and hydration of papermaking fibers was centered around a group of questions submitted by the members previous to the meeting. Ralph Atkins, Lee Paper Company, gathered the questions and acted as discussion leader. Most of the discussion dwelt on beating and refining equipment with emphasis on power economy. The experiences of the members present were narrated and various shades of opinion were expressed.

The committee for nomination of officers reported through Frank Hamilton, Chairman.

Those present included: Henry Allison, Jr., P. D. Applegate, Ralph Atkins, R. P. Aument, P. W. Bartholmew, Ray L. Barton, D. D. Cameron, Fred L. Chappell, C. T. Colgren, Kenneth Conrad, A. M. Cooper, W. G. Curry, C. F. Davis, J. A. Dean, Wm. J. Dial, Joe Doty, D. R. Erickson, Myron Flotow, M. S. Fogerty, B. E. Freeman, Charles E. Gardner, O. P. Gephart, R. C. Germanson, E. P. Gillan, F. R. Hamilton. J. J. Harrison, H. W. Hartman, W. F. Hathaway, John Heenan, Carl Hoelderle, John Hotop, H. J. Hotz, J. L. Kubicka, Stephen Kubolich, A. D. Long, R. T. Mashburn, D. W. McArthur, Ira P. Nicole, Al Perlick, C. C. Schneider, A. L. Sherwood, R. H. Siple, C. W. Smith, R. W. Staggs, Joe Waber, Merle R. Wilkins, James A. Wise, and Walter Wolfe.

New TAPPI Members

Robert L. Aries, field director, Northeastern Wood Utilization Council, Yale University, New Haven, Conn., a 1941 graduate of Brooklyn Polytechnic Institute.

Warren B. Beckler, Jr., works manager, Brown Corporation, LaTuque, P. Q., Canada, a 1917 graduate of the University of Maine.

Walter W. Burrows, Sr., vice-president, Williamsport Paper Box Company, Williamsport, Pa.; assistant to first vice-president and chief engineer, Aircooled Motors Corporation, Syracuse, N. Y., a 1939 graduate of Bucknell University.

Thomas Foulkes, project engineer, Ottawa Mill, E. B. Eddy Company, Hull, P. Q., Canada, a 1926 graduate of the University of New Brunswick.

Ralph A. Morgen, assistant director, Engineering and Industrial Experiment Station, University of Florida, Gainesville, Fla., a 1925 graduate of the University of California.

Felipe Mussi, chief of production, Juan Ortiz Mill, Celulosa Argentina, S. A., Province de Sante Fe, Argentina, a 1938 graduate of Universidad del Litoral.

Carlos A. Ricci, engineer, Technical Office, Celulosa Argentina, S. A., Rivadavia 620, Buenos Aires, Argentina, a 1942 graduate of Universidad de Buenos Aires.

Pulpwood Winner

WATERFORD, Vt., April 9, 1945—Three top winners in the annual Vermont state elimination pulpwood contest April 5 at the Niskiton Fish Club timber property were Norbert Dufresne of Greenboro, Arthur Lyonnais of East Burke and Lucian Belanger of Paul Strea Camp. They will compete at Laconia, N. H., May 5, for the Northeast Championship contests.

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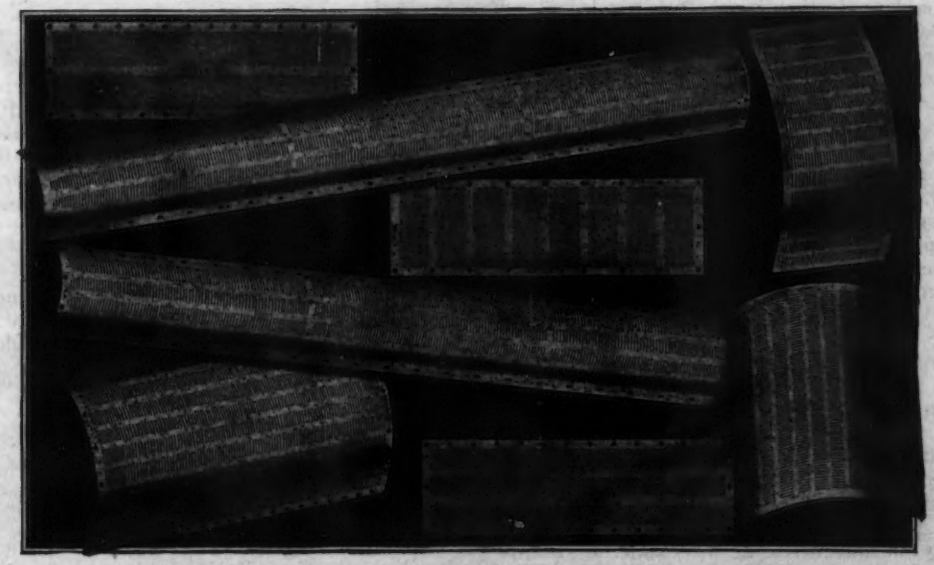

"HARDY" BRONZE and CHROME-NICKEL-STEEL SCREEN PLATES.

MAGNUS METAL CORP. FITCHBURG, MASS.

New York Paper and Pulp Market Review

Civilian Paper Supply Cut From 10 To 20 Percent In Groundwood, Book, and Fine Papers In Current Quarter — Wood Pulp Inventories Now At Critically Low Level—More Waste Paper Needed.

Office of the PAPER TRADE JOURNAL,
Wednesday, April 11, 1945.

Heavier all-over government requirements for paper and paperboard resulting in a gradual increasing curtailment in civilian supply, is the prospect for the current quarter. It is expected in some well informed circles that the peak of the short supply situation will be experienced in June. The end of the war in Europe and the opening of Scandinavian exports may occur before the current quarter ends, in which event conditions could not fail to improve substantially.

The heaviest cut thus far announced will include groundwood, book, and fine papers, of which there will be from 10% to 20% less tonnage for civilian consumption. The recently amended WPB orders, L-241, L-244, L-245, L-289, and M-241-a, impose delivery restrictions limiting the tonnage of paper which may be accepted in the second quarter. The objective sought by this restriction is to balance the over-all production and distribution of paper.

The index of general business activity for the week ended March 31 rose to 144.6, from 143.6 for the previous week, compared with 144.2 for the corresponding week in 1944. The index of paperboard production was 160.1, compared with 156.4 for the previous week, and with 140.0 for the corresponding week in 1944.

Paper production for the week ended March 31 was estimated at 88.9%, compared with 85.7% for 1944, with 88.6% for 1943, with 102.2% for 1942, and with 93.5% for the corresponding week in 1941.

Paperboard production for the week ended March 31 was 93.0%, compared with 93.0% for 1944, with 95.0% for 1943, with 100.0% for 1942 and with 83.0% for the corresponding week in 1941.

Wood Pulp

Inventories of wood pulp, according to one competent authority, have declined from 872,000 tons on January 1, 1941 to 300,000 tons on April 1, 1945. Approximately 100,000 tons of this inventory consist of non-paper grades of pulp, dissolving and nitrating types. The 200,000 tons of paper pulp is equivalent to less than one week's requirements.

Rags

Mill demand for new cotton cuttings is heavy in relation to supplies. Requirements of many mills are reported in some quarters as being only partially met at present. More cuttings are going into wipers and for miscellaneous uses other than papermaking, is one explanation widely discussed in the trade. Prices are strong at ceiling levels.

Buying by roofing mills of old cotton rags is broadening out and increasing in volume. Consumption is high at this date. Prices are firm at ceiling levels.

Old Rope and Bagging

The supply situation in Manila rope is slowly becoming more critical and more and more sisal fiber is reported being offered. Prices remain very firm at ceilings. Sisal quotations are at ceilings and current quotations on jute strings are reported firmer at this date.

The scrap bagging market is more active this week. Trading is widely reported as about fair at this date. Prices are nominal.

Old Waste Paper

Demand for old waste paper continues urgent and while some mills are in a relatviely favorable inventory position other mills are critically short of paper stock. Collections are good but as the supply of wood pulp is so short, more relief must come from increased salvage of waste paper. Prices are strong at ceiling levels in all grades.

Twine

No important change in the twine market has been reported this week. Demand is good in all available grades. Prices are firm and continue unchanged at this date.

T. B. Counselman in New Dorr Post

T. B. Counselman has been appointed by the Dorr Company to head the firm's Contract Engineering Division, with headquarters in New York. He will be in charge of the negotiation of contracts and orders for research, development, pilot plant tests, plant and process engineering and design.

Mr. Counselman comes to his new duties from the Dorr Company's Chicago offices, where he had been manager of the Industrial Division since 1928. As such he has had a great deal to do with developments in the concentration of low grade iron ores, about which he has written several technical articles. He has had extensive experience in the blast furnace industry, the cement industry, and many others—and also a long and varied background in research and process development. He is active in the American Institute of Mining Engineers, being a past chairman of the Chicago Section, past chairman of the Milling Methods Committee, past vice chairman of the Blast Furnace and Raw Materials Committee—among other honors and activities. He has an extensive acquaintance among leading industrialists in the Middle West, as well as in the East.

Z-Metal

A new 4 page folder on Rex Z-Metal Chain Belts is being distributed by the Chain Belt Company of Milwaukee.

The bulletin gives interesting and practical information regarding Z-Metal chain belts and their application. One of the factors claimed for this type casting is its remarkable resistance to corrosion due to the patented process of manufacture. Some of the more popular type chains, available in Z-Metal are illustrated.

For copies, request bulletin 460 from the Chain Belt Company, Milwaukee 4, Wis.

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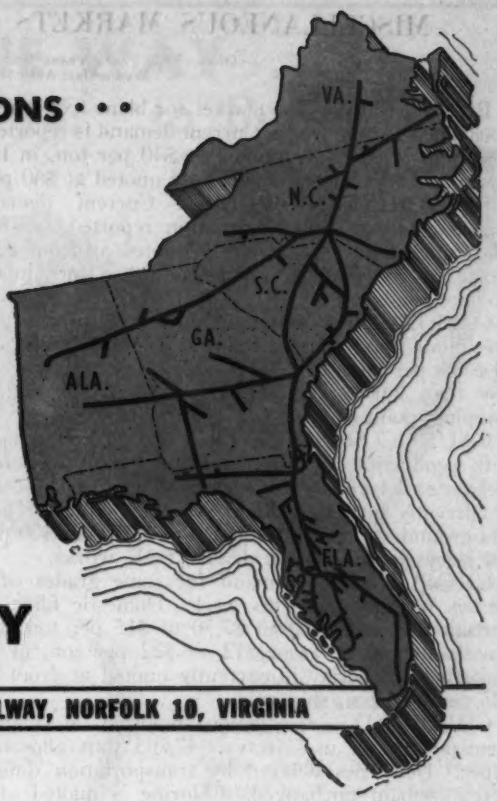

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MISCELLANEOUS MARKETS

Office of the PAPER TRADE JOURNAL,
Wednesday, April 11, 1945.

BLANC FIXE—The market for blanc fixe is reported unchanged for the week. Current demand is reported fair. The pulp is currently quoted at $40 per ton, in barrels, at works; the powder is currently quoted at $60 per ton.

BLEACHING POWDER — Current demand is reported active. Supply situation reported satisfactory. Bleaching powder is currently quoted at from $2.50 to $3.10 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CASEIN—OPA maximum prices on processed acid-precipitated casein are as follows: 10,000 pounds or more, 24 cents per pound; 2,000 pounds, 24¼ cents per pound; less than 2,000 pounds, 24¾ cents per pound, f.o.b. shipping point.

CAUSTIC SODA—Supply situation continues tight, with production high and very heavy all-over demand. Deliveries delayed by traffic congestion. Solid caustic soda is currently quoted at $2.30 per 100 pounds. The flake and ground are currently quoted at $2.70 per 100 pounds. All prices in car lots, in drums, f.o.b. works.

CHINA CLAY—Demand for some grades of china clay is reported fair this week. Domestic filler clay is currently quoted at from $7.50 to $15 per ton; coating clay is quoted at from $12 to $22 per ton, at mines. Imported china clay is currently quoted at from $13 to $25 per long ton, ship side.

CHLORINE — Production reported at high rate. Demand for all uses heavy. 42,705 tons allocated for paper. Deliveries delayed by transportation difficulties. Prices remain unchanged. Chlorine is quoted at $1.75 per 100 pounds, in single-unit tank cars, f.o.b. works.

ROSIN—Prices are quoted unchanged at OPA ceiling prices: "G" gum rosin at $5.79 per 100 pounds, in barrels, Savannah. "FF" wood rosin is currently quoted at $5.75 per 100 pounds in barrels, New York. Seventy per cent gum rosin is currently offered at $6.06 per 100 pounds, f.o.b. works. Conservation Order M-387 of February 28, limits rosin to 70% of 1944 quota for paper.

SALT CAKE—Demand reported moderate. Quotations on salt cake continue to remain unchanged. Domestic salt cake is currently quoted at $16 per ton.

SODA ASH — Market requirements for soda ash continue heavy. Production at capacity. Market tight. Deliveries slightly improved. Prices continue unchanged. Prices on soda ash in car lots, per 100 pounds, are as follows: in bulk, $.90; in paper bags, $1.05; and in barrels, $1.35.

STARCH—Market supply of cash corn reported smaller this week. Corn prices are less firm. Starch quotations continue unchanged. Pearl is currently quoted at $3.72 per 100 pounds. The powdered grade is currently quoted at $3.83 per 100 pounds. All prices f.o.b. Chicago.

SULPHATE OF ALUMINA — Supply situation reported good. Quotations are unchanged. Prices on the commercial grades are quoted at from $1.15 to $1.25 per 100 pounds. The iron free is currently quoted at $1.85 per 100 pounds. All prices in car lots, in bags, f.o.b. works.

SULPHUR—Demand is reported active for sulphur. Quotations on all grades continue unchanged. Annual contracts are currently quoted at $16 per long ton, f.o.b. mines. The current contract prices at Gulf Ports remains unchanged at $17.50 per long ton.

TALC—The market for domestic talc is reported fair this week. Quotations unchanged. Domestic grades are quoted at from $16 to $21 per ton, at mines.

MARKET QUOTATIONS

All market quotations, excepting those otherwise designated as official OPA maximum prices, are based on the manufacturers' price level as of October 1-15, 1941; maximum wholesale prices are based on the merchants' maximum prices for stipulated quantities at a quoted price to all customers of a like class, as shown by the merchant's sales records of goods delivered during March, 1942. A merchant's price list in effect in March 1942, showing quotations of actual shipments, will establish the current maximum prices.

Paper

(Delivered New York)

Standard News, per ton—			
Roll, contract	°$61.00	@	—
Sheets	69.00	@	—
° OPA Maximum Price.			
Kraft—per cwt.—Carload Quantities Zone A, f.o.b. Mill			
Superstandard Wrapping	°$5.25	@	—
No. 1 Wrapping	°5.00	"	—
Standard Wrapping	°4.75	"	—
Standard Bag	°4.375	"	—
° OPA Manufacturers' Prices.			
Tissues—Per Ream—Carlots			
White No. 1	1.12½	"	—
White No. 1 M. G.	1.10	"	—
White No. 1½	1.00	"	—
White No. 2	.90	"	—
Anti-Tarnish M.F.	1.20	"	—
Colored	—	"	—
Kraft	.95	"	—
Manila	.90	"	—
Toilet—1 M. Sheets—Per Case			
Unbleached	4.25	"	—
Bleached	5.70	"	—
Unbl. Toilet, 1 M.	4.16	"	—
Bleached Toilet	5.70	"	—
Paper Towels, Per Case—			
Unbleached, Jr.	2.20	"	—
Bleached, Jr.	3.20	"	—
Manila—per cwt.—C. l. f. a.			
No. 1 Jute	11.25	@	—
No. 1 Manila Wrapping, 35 lb.	6.00	"	6.25
No. 2 Manila Wrapping, 35 lb.	5.75	"	6.00
Boards, per ton—			
News	°50.00	@	—
Chip	°50.00	"	—
Sgl. Mla. Ll. Chip	°62.00	"	—
White Pat. Coated	°75.00	"	—
Kraft Liners 50 lb.	°63.00	"	—
Binders Boards	84.00	"	116.00

° OPA Base Prices per 10 tons. Less than 10 tons but over 3 tons, add $2.50; three tons or less, add $5; regular 35-39 basis, add $5.; basis 40-49, add $2.50; basis 91-100, add $2.50; basis 101-120, add $5.

The following are representative of distributors' resale prices:

Rag Content Bonds and Ledgers—White, Assorted Items, Delivered in Zone 1:

	Bonds		Ledgers
100% Rag Ext. No. 1	$39.10 @	$46.00	$40.25 @ $47.25
100% Rag	32.20 "	37.75	33.35 " 39.25
85% Rag	.... "	....	29.90 " 35.00
75% Rag	23.00 "	27.00	24.15 " 28.25
65% Rag	.... "	....	22.80 " 27.75
50% Rag	18.70 "	22.75	19.90 " 24.25
25% Rag	16.40 "	20.00	17.55 " 21.50

Colors at $1.00 cwt. extra.

Sulphite Bonds and Ledgers—White, Assorted Items. Delivered in Zone 1:

	Bonds		Ledgers
No. 1	$10.55 @	$12.75	$11.70 @ $14.25
No. 2	9.65 "	11.75	10.80 " 13.25
No. 3	9.20 "	11.25	10.35 " 12.50
No. 4	8.90 "	10.75	10.05 " 12.25

Colors $1.00 cwt. extra.

Free Sheet Book Papers—White, Cased Paper. Delivered in Zone 1:

No. 1 Glossy Coated	$13.65	@	$13.30
No. 2 Glossy Coated	12.40	"	14.00
No. 3 Glossy Coated	11.60	"	13.25
No. 4 Glossy Coated	11.15	"	12.75
No. 1 Antique (watermarked)	10.25	"	11.75
No. 2 Offset	9.60	"	11.00
A Grade E. F.	9.35	"	10.75
A Grade S. & S. C.	9.60	"	11.00
B Grade E. F.	8.85	"	10.25
B Grade S. C.	9.10	"	10.50
C Grade E. F.	8.55	"	9.75
C Grade S. C.	8.80	"	10.00
D Grade E. F.	8.25	"	9.50
D Grade S. & S. C.	8.50	"	9.75

Ivory & India at $.50 cwt. extra.

Wood Pulp

OPA Maximum Prices and Canadian Manufacturers Prices, Less Freight Not Exceeding OPA Allowances.

Bl. Softwood Sulphite	$86.00
Unbl. Softwood Sulphite	74.00
Bl. Hardwood Sulphite	83.50
Unbl. Hardwood Sulphite	71.50
Bl. Mitscherlich	81.00
Unbl. Mitscherlich	72.00 @ 82.00
N. Bleached Sulphate	86.00
S. Bleached Sulphate	79.00
N. Semi-Bleached Sulphate	82.00
S. Semi Bleached Sulphate	75.00
N. Unbl. Sulphate	73.00
S. Unbl. Sulphate	63.50
Bl. Soda	76.00
Unbl. Soda	72.00
Groundwood	50.00

Transportation Allowances

Applying to Producers of Wet Wood Pulp.

	Below 50% Air Dry Weight
Northeast	$13.50
Lake Central	13.50
Southern	16.00
West Coast (in area)	10.50
West Coast (out area)	16.50

	50%-80% Air Dry Weight
Northeast	11.50
Lake Central	11.50
Southern	14.00
West Coast (in area)	9.50
West Coast (out area)	15.50

Applying to Producers of Dry Wood Pulp.

	Above 80% Air Dry Weight
Northeast	$8.50
Lake Central	8.50
Southern	11.00
West Coast (in area)	7.50
West Coast (out area)	13.50

Should freight charges actually exceed these allowances, the difference may be added to the maximum prices

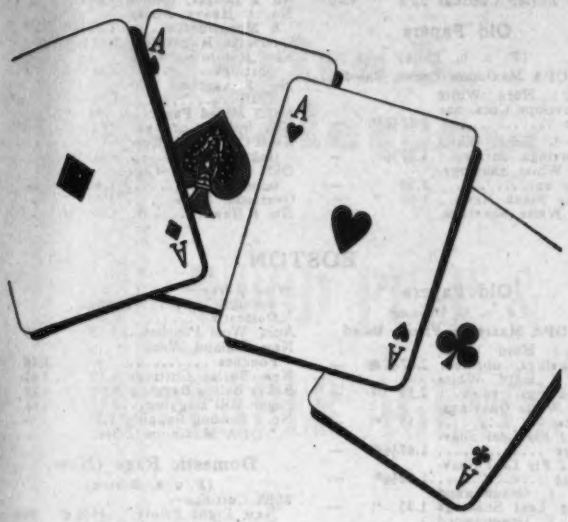
Domestic Rags

New Rags

(Prices to Mill f. o. b. N. Y.)

Shirt Cuttings—			
New White, No. 1	6.50	@	7.25°
Silesias No. 1	—	"	5.75°
New Unbleached	6.75	"	7.50°
Blue Overall	—	"	5.50°
Fancy	—	"	3.50°
Washables	—	"	3.00°
Bleached Khaki Cuttings	—	"	4.25°
Unbleached Khaki Cuttings	—	"	3.50°

°OPA Maximum Prices



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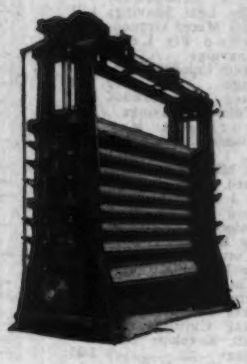

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Rolls • Calender Stacks • Roll Calipers • New Improved Roll Grinding Machines

Old Rags

...aste, No. 1—			
Repacked	*1.80	"	—
Miscellaneous	*1.20	"	—
...hite, No. 2—			
Repacked	*2.90	"	—
Miscellaneous	*2.65	"	—
...ird and Blues—			
Repacked	*2.20	"	—
Miscellaneous	*1.80	"	—
...ooking Rags—			
No. 1	*1.55	"	—
No. 2	*1.45	"	—
No. 3 (bagging)	*1.35	"	—
No. 4	*1.35	"	—
No. 5A	*1.35	"	—
Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

All Prices nominal

New Rags

New Dark Cuttings	2.25	@	2.40
New Mixed Cuttings	2.00	"	2.20
New Light Silesias	5.50	"	5.75
Light Flannelettes	5.50	"	5.75
New White Cuttings	7.00	"	7.50
New Light Oxfords	4.00	"	4.50
New Light Prints	3.00	"	3.25

Old Rags

No. 1 White Linens	7.50	"	8.50
No. 2 White Linens	6.50	"	7.50
No. 3 White Linens	4.50	"	—
No. 4 White Linens	2.25	"	3.25
No. 1 White Cotton	4.25	"	4.75
No. 2 White Cotton	3.25	"	3.75
No. 3 White Cotton	2.50	"	3.00
No. 4 White Cotton	1.90	"	2.20
Extra Light Prints	2.00	"	2.40
Ord. Light Prints	1.75	"	2.15
Med. Light Prints	1.55	"	1.95
Dutch Blue Cottons	2.25	"	2.50
French Blue Linens	3.00	"	—
Checks and Blues	2.00	"	—
Linsey Garments	1.90	"	2.00
Dark Cottons	1.50	"	1.60
Old Shopperies	1.30	"	1.45
New Shopperies	1.45	"	1.50
French Blues	2.25	"	2.50

BAGGING

(Prices to Mill, f. o. b. N. Y.)

...nny No. 1—			
Foreign	Nominal		
Domestic	4.25	@	4.35
Wool Tares, light	4.25	"	4.50
Wool Tares heavy	4.50	"	5.00
Bright Bagging	4.50	"	4.85
Manila Rope—			
Foreign	—	"	—
Domestic	*5.75	"	—
Jute Threads	5.50	"	—
No. 1 Sisal Strings	*4.00	"	—
Mixed Strings	2.00	"	—

*OPA Maximum Price.

Old Waste Papers

(F. o. b. New York)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	@	—
No. 1 Hard White Envelope Cuts	3.12½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, one cut	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Mixed Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
Mixed Groundwood Colored Shavings	.90	"	—
Overissue Magazines	1.67½	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Mixed Books	1.10	"	—
No. 1 White Ledger	2.30	"	—
No. 2 Mixed Ledger, colored	2.00	"	—
New Manila Envelope Cuttings, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
Extra Manilas	1.95	"	—
Mixed Kraft, Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
Triple Sorted, No. 1 Brown Soft Kraft	2.50	"	—
New 100% Kraft Corrugated Cuttings	2.25	"	—
No. 1 Assorted Old Kraft	1.75	"	—
New Jute Corrugated Cuttings	.90	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Box Board Cuttings	.72½	"	—
White Blank News	1.65	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
Old Corrugated Containers	.82½	"	—
Mill Wrappers	1.10	"	—

Twines

All Prices Nominal

(F. o. b. Mill)

(Soft Fiber)

Coarse Polished—			
India	.21	@	—
White Hemp	.21	"	—
Fine Polished—			
Fine India	.26	"	—
Unpolished—			
Box	.17½	"	—
Paper Makers	.17	"	—
Tube Rope	.1[illegible]	"	—
Wall Paper	.20½	"	—
Wrapping	.23	"	—
Soft Fiber Rope	.19	"	—
Cotton	.25	"	—

(Hard Fiber)

Medium Java	.18	"	—
Mex. Sisal	.16	"	—
Manila	—	"	—

PHILADELPHIA

Domestic Rags (New)

(Price to Mill.)

Shirt Cuttings—	
New White No. 1	.07¼
New White No. 2	.05¼
Light Silesias	.05¼
Black Silesias, soft	.03¼
New Unbleached	.07½
Washable Prints	.04¼
Washable No. 1	.03
Blue Overall	.05½
Cottons—According to grades—	
Washable shredding	.01¼
Fancy Percales	.04¼
New Black Soft	.03¼
Khaki Cuttings—	
Unbleachable Cotton Cuttings	.03½
Bleachable Cotton Cuttings	.04¼
Men's Corduroy	.03½
Ladies' Corduroy	.05
Cottonades	.03¼

Domestic Rags (Old)

White No. 1—Repacked	3.80	"	—
Miscellaneous No. 1	3.20	"	—
Miscellaneous No. 2	2.65	"	—
White No. 2—Repacked	2.90	"	—
Thirds and Blues—			
Miscellaneous	1.80	"	—
Repacked	2.20	"	—
Black Stockings—			
(Export)	Nominal		
Roofing Stock—			
Foreign No. 1	Nominal		
Domestic No. 1	1.55	"	—
Domestic No. 2	1.45	"	—
Roofing Bagging	1.35	"	—
Old Manila Rope	1.75	"	—

Bagging

(F. o. b. Phila.)

Gunny No. 1—			
Foreign	Nominal		
Domestic	3.00	"	3.10
No. 1 Clean bright—			
Sisal Strings			.84
No. 2 Clean bright—			
Sisal Strings			.82
Sisal Jute			.02½
Scrap—			
No. 1	1.25	"	1.30
No. 2	1.75	"	1.80
Wool Tares, heavy	4.00	"	4.25
No. 1 New Light Burlap	3.00	"	4.00
New Burlap Cuttings	3.75	"	4.00

Old Papers

(F. o. b. Phila)

OPA Maximum Prices, Baled

No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
Soft White Shavings, one cut	2.50	"	—
White Blank News	1.65	"	—
Soft White Shavings			
Misc.			1.15
No. 1 White Ledger	2.30	"	—
No. 2 Ledger, colored	2.00	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
Overissue Magazines	1.67½	"	—
New Manila Envelope Cuttings	2.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Box Board Cuttings	.72½	"	—
Kraft Corrugated Cuttings	2.25	"	—
Old Corrugated Containers	1.40	"	—
Overissue News	1.00	"	—
No. 1 News	1.00	"	—

BOSTON

Old Papers

(F. o. b. Boston)

OPA Maximum Prices, Baled

No. 1 Hard White Shavings, unruled	2.87½	@	—
No. 1 Hard White Shavings, ruled	2.50	"	—
Soft White Shavings, Misc.	2.15	"	—
No. 1 Fly Leaf Shavings	1.67½	"	—
No. 2 Fly Leaf Shavings	1.12½	"	—
No. 1 Groundwood Fly Leaf Shavings	1.25	"	—
No. 2 Groundwood Fly Leaf Shavings	.90	"	—
Mixed Colored Shavings	.75	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
Hard White Envelope Cuts, one cut	3.37½	"	—
Triple Sorted No. 1 Brown Soft Kraft	2.50	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
Kraft Envelope Cuttings	3.25	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
New Manila Envelope Cuts, one cut	2.87½	"	—
New Manila Envelope Cuttings	2.65	"	—
White and Colored Tabulating Cards	2.25	"	—
Ground Wood Tabulating Cards	1.35	"	—
White Blank News	1.65	"	—
No. 1 Assorted Old Kraft	1.75	"	—
No. 1 Mixed Paper	.95	"	—
Overissue News	1.10	"	—
Box Board Cuttings	.72½	"	—
New Corrugated Cuttings, Kraft	2.25	"	—
Old 100% Kraft Corrugated Containers	1.75	"	—
Old Corrugated Containers	1.40	"	—
Jute Corrugated Cuttings	1.07½	"	—

Bagging

(F. o. b. Boston)

Gunny Bagging—			
Foreign	(nominal)		
Domestic	—	@	2.50
Sisal Rope No. 1	*4.75	"	—
Sisal Rope No. 2	*4.25	"	—
Mixed Rope	—	"	1.55
Transmission Rope—			
Foreign	(nominal)		
Domestic	2.75	"	3.00
Manila Rope—			
Foreign	(nominal)		
Domestic	5.75	"	—
Soft Jute Rope	5.25	"	—
Jute Car Threads	3.00	"	3.50
Bleachery Burlap	8.50	"	9.00
Scrap Burlap—			
Foreign	(nominal)		
Domestic	—	"	3.00
South American	—	"	3.25

Wool Tares—			
Foreign	(nominal)		
Domestic	4.25	"	
Aust. Wool Pouches	3.25	"	3.50
New Zealand Wool Pouches	—	"	3.50
New Burlap Cuttings	4.75	"	5.00
Heavy Baling Bagging	4.00	"	4.25
Paper Mill Bagging	2.50	"	3.00
No. 2 Roofing Bagging	1.35	"	—

*OPA Maximum Price.

Domestic Rags (New)

(F. o. b. Boston)

Shirt Cuttings—			
New Light Prints	.04¼	@	.04½
Fancy Percales	.04¼	"	.05
New White No 1	.06¼	"	.07
New Light Flannelettes	.05½	"	.06
Canton Flannels, Bleached	.06	"	.06½
Underwear Cutters, Bleached	.06¼	"	.06½
Underwear Cutters, Unbleached	.05¼	"	.06
Silesias No. 1	.06	"	.06½
New Black Silesias	.03	"	.03½
Red Cotton Cuttings	.03½	"	.04
Soft Unbleached	.06¼	"	.06½
Blue Cheviots	.05¼	"	.06
Fancy	.02¼	"	—
Washable	.02¼	"	—
Khaki Cuttings	.02¼	"	.03
O. D. Khaki	.03½	"	.03½
Corduroy	.03¼	"	.03½
New Canvas	.06½	"	.06½
B. V. D. Cuttings	.06½	"	.06½

Domestic Rags (Old)

(F. o. b. Boston)

White No. 1—			
Repacked	3.80	@	3.90
Miscellaneous	3.20	"	3.25
White No. 2—			
Miscellaneous	2.65	"	2.70
Twos and Blues, Repacked	2.20	"	2.25
Old Blue Overalls	2.25	"	2.30
Thirds and Blues, Repacked	2.20	"	2.25
Miscellaneous	1.80	"	1.85
Black Stockings	3.50	"	4.00
Roofing Stock—			
No. 1	1.55	"	1.60
No. 2	1.45	"	1.50
No. 3	1.35	"	1.40
No. 4	1.35	"	1.40
No. 5, Quality A	1.35	"	1.40
Quality B	1.20	"	1.25
Quality C	.95	"	1.00
*Old Manila Rope	5.75	"	—

*OPA Maximum Prices.

Foreign Rags

(F. o. b Boston)

Canvas	(nominal)
Dark Cottons	(nominal)
Dutch Blues	(nominal)
New Checks and Blues	(nominal)
Old Fustians	(nominal)
Old Linsey Garments	(nominal)
New Silesias	(nominal)

CHICAGO

Waste Paper

(F. o. b. Chicago)

OPA Maximum Prices, Baled

Shavings—			
No. 1 Hard White Envelope Cuts, one cut	3.37½	"	—
No. 1 Hard White Shavings, unruled	2.87½	"	—
No. 1 Soft White Shavings	2.50	"	—
No. 1 White Ledger	2.30	"	—
No. 1 Heavy Books & Magazines	1.92½	"	—
White Blank News	1.65	"	—
Mixed Kraft Env. & Bag Cuttings	2.75	"	—
No. 1 Assorted Old Kraft	1.75	"	—
Overissue News	1.10	"	—
No. 1 News	1.00	"	—
No. 1 Mixed Paper	.95	"	—
No. 1 Roofing Rags	1.55	"	—
No. 1 Roofing Bags	1.45	"	—

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KOSMOS—DIXIE PARIS BLACKS

Unexcelled carbon black pigments for all types of paper and board stocks.

Outstanding for soft texture, particle fineness, and jet black color.

Best for performance in the Beater and Jordan because of ease of wetting and ready dispersion in the pulp.

Takes well to the fiber and shows high retention.

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MAMCO Overlapping Delivery Tape Systems
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STATIC ELECTRICITY ELIMINATORS
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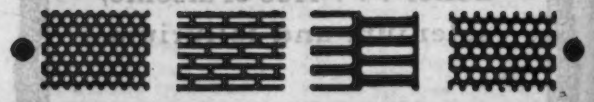

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stretch pulp *by de-inking*

Here's a process that helps to take mills over the hump of pulp shortages. They use Metso Sodium Metasilicate to de-ink waste paper stocks, which results in a cleaner pulp as well as a whiter pulp. One of our mill customers turns out a smooth sheet with a high quality feel*, which is made from 5% virgin pulp and 95% de-inked stock.

Metso with its quick wetting, effective dispersing and emulsifying powers can improve your results in de-inking waste paper stocks (it works on rotogravure and magazine stocks too). Send for full particulars now. *Sample on request.

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BLEACHED SULPHITE AND SODA PULP
BLEACHED AND UNBLEACHED KRAFT PULP

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Tyrone, Pennsylvania
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to the Mill Supt.

Who Wants to Up Circulation in His Beaters and Improve Quality of Furnish

It can be done . . . and scores of mill superintendents have proved that a little experimenting with different type bars or a combination of types will often pay big dividends.

One example: The superintendent of a Wisconsin unit of a large chain of mills believed, with good reason, that he was not getting sufficient circulation in his beaters. At the suggestion of one of our beater engineers, he removed the straight commercial quality bars he had been using and put in alternate *custom-forged* SWW corrugated and SWW staggered bars.

This change in both quality and type of bars not only brought about the desired circulation increase, but also achieved a marked improvement in the quality of furnish. Indeed, results proved so gratifying that this entire chain of mills is now changing over to SWW *custom-forged* bars . . . straight, corrugated or staggered . . . or some combination of the three types, as individual conditions require.

If you have a beating problem . . . and who hasn't . . . why not talk it over with one of our men? It would involve no obligation on your part and may lead to the kind of production and profits you are daily striving for. Write today.

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BEATERS
2—2000 lb. Holyoke Iron Tub Beaters.
2—400 lb. Gavit—iron tub beaters.

BLOWER
1—50" Buffalo.
Various other sizes.

CALENDER STACKS
1—11-Roll 92" Face Calender Stack—complete with Drive.
1—36" 7-roll—Holyoke Machine.
1—77" 2-roll—Moore & White.
1—86" 5-roll—Black-Clawson.

CENTRAP
1—Shartle Brothers Centrap.

CYLINDER MOULDS
1—48" Diameter x 96" Face.
8—30" diameter x 72" face.
3—30" diameter x 74" face.
2—36" diameter x 118" face.
1—36" diameter x 90" face.

DRIVES
2—D. O. James 75 H.P. Speed Reducers with couplings and motor bases. Ratio 2.16 to 1. 900 RPM to 418 RPM.

DRYERS
18—Dryers — 36" Diameter x 94" Face — complete with 2-deck Frames, etc.
1—48" diameter x 94"face.
2—36" x 44" face—with frames and bearings.
1—24" diameter x 84" face. (Baby).
1—16" diameter x 84" face. (Baby).
3—36" diameter x 116" face.
2—28" diameter x 68" face.

EMBOSSER
1—28" two roll Embossing Calender.

ERKENSTATORS
3—I. W. E. Erkenstators—bronze construction—complete with motors, starters and distributing box.

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1—600 ton Dunning & Boschert hydraulic hydraulic pump, valves, piping, etc. — Platen 38" x 38"—ram 20" diameter — Pulp Baling Press—low and high pressure daylight 50"—stroke 36".

JORDANS
1—Pony Horne Jordan. Spare New Fillings.
1—Black-Clawson Jordan (belt driven).
1—#9 Emerson Jordan—for direct connection of a motor — requires use of 400 H.P. motor.
1—Smith & Winchester.

MOTOR
1—100 H.P. General Electric Synchronous Motor—450 R.P.M.—Late type, including starting equipment.

PIPE THREADER
1—Eaton, Cole & Burnham Company pipe threader—2" to 8"—complete with dies.

PULP EQUIPMENT
1—84" Carthage Chipper—complete and in excellent condition.
1—32" three pocket Glens Falls Grinder (for 27" wood).
3—Rotary incinerators—9' diameter x 20' long.
4—27" four pocket Sandy Hill grinders (for 24" wood—including 1000 H.P. motor for each, starting equipment, etc.).

PULPERS
1—#2 Lannoye Pulper.
1—Jones Pulper — direct connected to 60 H.P. motor—3 phase, 60 cycle, 440 volts —forward and reverse starting.

PUMPS
1—Buffalo Pump—5500 g. p. m., direct connected to 100 H.P. Motor (50' head).
Various sizes of Centrifugal and Plunger Pumps. Write us regarding your particular requirements.

REELS
1—2 Bowl Reel — 112" face — bowls 20" diameter.
1—2 Bowl Reel—63" face.
1—2 Bowl Reel—110" face.

ROLLS
500—Brass tube—steel tube—rubber covered iron rolls—various sizes.

RUBBER COUCH ROLLS
1—72¼" Face x 9" diameter (soft rubber).
1—84½" face x 16" diameter (soft rubber).

SAVEALLS
1—#6 Bird Saveall—Mold 43 x 125—including couch roll.
1—Shartle Bros. decker 36" diameter x 60" face.
1—North Saveall—cylinder mould 72" diameter x 100" face.

SHREDDERS
1—#25 CRSE Mitts & Merrill Hog.
1—Gilman Shredder—used one year.
1—Taylor Stiles #5 Pulp Shredder.

SHEETERS
1—103" Hamblet Single Knife Sheeter — complete with Slitting Device.
1—110" Horne single knife rotary sheet cutter.

SIZING MACHINE
1—36" Waldron sizing machine.

SLITTERS
1—114" Two drum Langston Slitter & Winder.
1—110" Beloit slitter (slitter attachment only).
1—114" Two drum Kidder slitter and winder.
1—36"Koegel slitter and winder.

SUCTION BOXES
1—Nash 100" face Suction Box.
1—Nash 125" face Suction Box
3—Brass Suction Boxes—90" drilled face.
2—Brass Suction Boxes—77½" drilled face.

SUCTION COUCH ROLL
1—Sandusky Suction Couch Roll — 18" diameter x 130" face — Complete with Sturtevant Vacuum Pump and drive mechanism.

SUCTION PRESS ROLLS
1—Sandusky suction press roll, Bronze — 14 5/16" diameter x 77" drilled face.
1—Sandusky Suction Press Roll — 14 5/16 diameter x 68" drilled face.

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TEL. BIGELOW 3-3720 A-12

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WANTED — Master Mechanic and Millwright with paper mill experience. Reply to Mr. T. J. Russell, Mill Manager, Sangamon Paper Mills, Eaton, Indiana. A-12

WANTED — Machine Tenders, Back Tenders and Third Hands for cylinder machine. Reply to Mr. T. J. Russell, Mill Manager, Sangamon Paper Mills, Eaton, Indiana. A-12

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Positions Now Open
COMPTROLLERS, OFFICE MANAGERS, ACCOUNTANTS
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CHEMISTS (several) $3,000 to $6,000 a year
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BOSS MACHINE TENDER, FOURDRINIER MACHINES, light weight papers
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Back Tenders and Third Hands for cylinder machines making folding boxboard. Vertical stack dryers. Permanent positions with highest pay and good opportunity for advancement.

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M-3

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WANTED—Machine Tender and Back Tender. Apply to George J. Lenz, Supt., Peerless Paper Mills, Oaks, Pa. A-19

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CHEMIST—for eastern paperboard mill and folding carton fabrication plant. Experience or training in both branches of field required. Give complete information including personal status and salary expected. Address Box 45-211 care Paper Trade Journal. A-26

WANTED—Superintendent — cylinder machine. Experienced on dry saturating felt. Give references, age, married or single, where employed. Confidential. Pacific Coast. Address Box 45-212 care Paper Trade Journal. A-26

MASTER MECHANIC thoroughly qualified to handle electrical and machine shop work, and take charge of all maintenance in modern wax paper plant. Good salary. Steady employment. Address Box 45-215 care Paper Trade Journal. A-19

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And that is unfortunate, because they keep remembering what a whiz the beater was 20 years ago and are, as a consequence, still somewhat in the dark concerning "Hydrafining."

Luckily, such a condition can be remedied by consulting Dilts Machine Works or investigating an actual installation. Dilts will be glad to advise you where you can see the hydrafiner "in action." What you learn will be *worth* remembering.

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DILTS HYDRAFINERS

Shartle Bros. Dilts

HELP WANTED

WANTED — Practical Paper Mill Machinery Mechanic experienced, capable of taking charge of shop rebuilding used paper mill equipment. Excellent proposition for good man. Address Box 45-228 care Paper Trade Journal. A-12

WANTED—Engineering Draftsman for Post War Work on Paper Mill Machinery. Experience in Paper Mill equipment design helpful. Location: Appleton, Wisconsin. EMPLOYER: Old established paper machinery builder. Excellent future opportunity. Address Box 45-219 care Paper Trade Journal. M-3

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SUPERINTENDENT—25 years experience in Book, Bond and Specialty Mills, using Kraft Sulphite, Rag Stock, De-inked stock, Soda Pulp, etc. 40 years of age. Conscientious, aggressive and capable of taking complete charge. Address Box 45-148 care Paper Trade Journal. A-12

PROJECT ENGINEER—MIT graduate, experienced construction and maintenance, kraft, sulphite or groundwood. Capable assuming full charge project design and construction. Draft exempt. Address Box 45-187 care Paper Trade Journal. A-12

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PRODUCTION MAN—Thoroughly experienced in production and supervision all varieties fine cardboards. Successful record personnel relations Address Box 45-4 care Paper Trade Journal. A-26

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DIRECTOR OF PURCHASES — Thoroughly experienced in contracting, selection of materials, expediting, disposal of surplus, initiating use of new materials, inventory control, material control, acceptance, subcontracting, traffic and inspection of materials needed to operate a pulp and paper mill. Conscientious, aggressive and capable. Address Box 45-203 care Paper Trade Journal. A-19

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MECHANICAL ENGINEER with fifteen years experience in tissue manufacture and conversion. Best of references as to ability as producer and executive. Age 45 years. Address Box 45-226 care Paper Trade Journal. A-19

SUPERINTENDENT Finishing and Shipping or Paper Converting Plant. Years broad practical experience. Proficient equipment operation Mfg. and Converting, order scheduling, inventories, etc. Wrapping Tissue, Envelope, Bonds, Book, News, Waxed, Oiled, Specialties. Available at once. Address Box 45-214 care Paper Trade Journal. M-3

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New and guaranteed used steel pipe, boiler tubing, valves, fittings, wood and steel tanks, steel buildings

JOS. GREENSPON'S SON PIPE CORP.
NATIONAL STOCK YARDS, Illinois. S-6

FOR SALE

FOR SALE

FOR SALE

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Waverly 3-5675

100"—Hamblet Single Knife Sheeter—ball bearing throughout, with one Maxson layboy, 4 piles complete with counter and marker for counting reams of 500 sheets. This machine purchased new in 1941. Used less than 100 hours.
1—#10 Camachine with mill roll stand rewind with 36" diameter. Excellent condition. Used four years.
200—SKF Ball Bearings #6220—new, in original boxes—immediate shipment—no priority needed.
1—A. D. Wood Saveall—cylinder—60" face by 48" diameter—ball bearing equipped—rebuilt—specifications on request.
1—No. 1 Voith Pulper—capacity 20 tons per day—requires 20 h.p.
1—42" Liner and combining machine. Fourteen 6" diameter steam heated rolls and one drier 24" diameter.
1—60" face—16" diameter couch roll—one and ½" rubber—ball bearing equipped—used two months.
3—Improved Paper Machy. Corp. #2 Knotters Bronze fitted. Good condition. Prints on request.
1—#2 Miami Jordans 3½" bronze fillings for direct connection to motor.
1—65 ton Vertical Lime Kiln.
4—14" x 20" Connersville Vacuum Pumps. These pumps are fully rebuilt.
3—12" x 18" Connersville Vacuum Pumps. These pumps are fully rebuilt.
1—Downingtown 2500 lb. Iron Tub Cyclone Beater. Beater rolls 60" face, 72" diameter. This beater is in excellent condition, having been in operation less than 2 years. Prints on request.
1—44" Waldron drum reeling and rewinding machine.
2—Holyoke Platers—2 roll, 36" face x 18" diameter—complete with drive.

A-12

FOR SALE

Two new Calender rolls 10 x 119

One 158" ten roll Calender stack

One 143"—7 roll Calender stack

One 130—9" roll Calender stack

One 120—11" roll Calender stack

Two 108"—7 roll Calender stack

One 104"—11 roll Calender stack

One 88"—9 roll Calender stack

One 45"—3 roll Calender stack

Address Box No. 45-208 care Paper Trade Journal. A-26

FOR SALE

45" Standard Beck Rotary Sheet Cutter.
1—40" Clark and 1—42" Moore & White Rotary Sheet Cutters.
1—Noble & Wood Mammoth Jordan with new shell and plug fillings.
1—Standard Horne Jordan with extra shell and plug fillings.
1—34" Late type Waldron Embosser with inking attachment. Practically new.
3—Double-drum Warren Winders, 82", 103" and 104" wide.
1—45" Hobbs Double Scorer and Creaser.
1—45" Robinson Rotary Scorer and Slitter.
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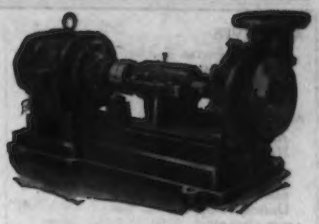

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Witco Chemical Co.

FLOORING, GRATING & TREADS
Hendrick Mfg. Co.
Kemp, W. F., Co.
Norton Co.
Manhattan Rubber Mfg. Div. of Raybestos-Manhattan, Inc.
Robinson, C. P.
United States Rubber Co.

FORMING MACHINES
Downingtown Mfg. Co.
Noble & Wood Machine Co.
Oliver United Filters
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.

WHERE TO BUY

GEARS
Black-Clawson Company
De Laval Steam Turbine Co.
Downingtown Mfg. Co.
Farrel-Birmingham Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

GRINDERS
Covel-Hanchett Co.
Farrel-Birmingham Co.
Lobdell Car Wheel Co.
Montague Machine Co.
Samuel C. Rogers and Company
The Sandy Hill Iron & Brass Works

GRINDING WHEELS
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Simonds Worden White Co.
United States Rubber Co.

HEATING, VENTILATING AND AIR CONDITIONING
The Appleton Machine Co.
Armstrong Machine Works
E. D. Jones & Sons Co.
General Electric Co.
Grinnell Company
Leeds & Northrup
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Ross Engineering Corp., J. O.
Shartle Brothers Machine Co.
Valley Iron Works Co.
Worthington Pump & Mchy Corp.

HOISTS
Appleton Machine Co.
Dilts Machine Works
Rodney Hunt Machine Co.
Ingersoll-Rand Co.
E. D. Jones & Sons Co.

HOSE (Air, Water, Suction, etc.)
The Cincinnati Rubber Mfg. Co.
The Manhattan Rubber Manufacturing Division of Raybestos-Manhattan Inc.
United States Rubber Co.

INSTRUMENTS, TESTING AND MEASURING
W. H. & L. D. Betz
M. P. Bowsher
The Foxboro Company
General Electric
W. & L. E. Gurley
Leeds & Northrup Company
National Technical Laboratories
B. F. Perkins & Son
Taylor Instrument Cos.
Wallace & Tiernan Co., Inc.
Westinghouse Electric & Manufacturing Company
Wilkens-Anderson Co.

JORDAN FILLINGS
Appleton Machine Co.
Behr Brothers Mfg. Co.
E. D. Jones & Sons Co.
Noble & Wood Machine Co.
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

KNIVES
Black-Clawson Company
Dilts Machine Works, Inc.
Hamblet Machine Co.
E. D. Jones & Sons Co.
Simonds Worden White Co.
Valley Iron Works Co.

LABORATORY EQUIPMENT
Appleton Machine Co.
W. H. & L. D. Betz
Dilts Machine Works
E. D. Jones & Sons Co.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Taber Instrument Co.
Taylor Instrument Companies
Valley Iron Works Co.

LAY BOYS
Hamblet Machine Co.
Moore & White Co.
Shartle Brothers

LUBRICANTS
Gulf Oil Corporation
Gulf Refining Co.
Sinclair Refining Co.
Socony-Vacuum Oil Co., Inc.
Sun Oil Company
Tide Water Associated Oil Co.

LUBRICATORS
Hills-McCanna Co.

MICROMETERS & CALIPERS
Farrel-Birmingham Co.
Montague Machine Co.
Lobdell Car Wheel Co.
Walker-Goulard-Plehn Co.

MIXERS
Youngstown Welding & Engrg. Co.

MOISTENING EQUIPMENT
The Spray Engineering Co.

MOTORS AND GENERATORS
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Co.
Ingersoll-Rand Co.
Reliance Electric & Engrg. Co.
Westinghouse Electric & Manufacturing Company

PACKING BOXES
Johnson Corporation
Shartle Brothers Machine Co.

PACKING
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
United States Rubber Co.

PAPER MACHINES
Black-Clawson Company
Downingtown Mfg. Co.
Thomas W. Hall Co.
Moore & White Co.
Pusey & Jones
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester

PAPER MACHINE SLICES
Black-Clawson Company
E. D. Jones & Sons Co.
Montague Machine Co.
The Sandy Hill Iron & Brass Works
Valley Iron Works Co.

PAPER TUBE MACHINERY
Dietz Machine Works
Thomas W. Hall Co.
Hudson Sharp Machine Company
Langston Co., Samuel M.

PASTING MACHINES
Black-Clawson Company
Davis, Frank H., Co.
Murray, D. J., Mfg. Co.
Moore & White Co.
Potdevin Machine Co.
Shartle Brothers Machine Co.
Waldron Corp., John

PERFORATED METAL
Allis-Chalmers Mfg. Co.
Harrington & King Perforating Co.
Hendrick Mfg. Co.

PIPE
Black-Clawson Company
Crane Company
Grinnell Company
Shartle Brothers Machine Co.
Taylor Forge & Pipe Works
Walworth Company
Youngstown Welding & Engrg. Co.

PLATERS
The Norwood Engineering Company
Perkins & Son, Inc., B. F.

PLATES
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Hendrick Mfg. Co.
Klemp, W. F., Co.
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.
Timken Roller Bearing Co.

PLUGS
Black-Clawson Company
E. D. Jones & Sons Co.
The Noble & Wood Machine Co.
The Richardson Economy Plug Co.
Shartle Brothers Machine Co.

PRESSES
Black-Clawson Company
Farrel-Birmingham Co.
Dietz Machine Wks.
Thomas W. Hall Co.
Hudson-Sharp Machine Co.
Paper Converting Machine Co., Inc.
Potdevin Machine Co.
Rotogravure Engineering Co.
Shartle Brothers
Valley Iron Works Co.
Waldron Corp., John
Weber, Homer C.

PUG MILLS
Traylor Engineering & Mfg. Co.

PULPS
Andersen Co., J.
Bulkley, Dunton Pulp Co., Inc.
Gotterman & Co., Inc.
Perkins-Goodwin Co.
Price & Pierce, Ltd.
Pulp and Paper Trading Co.

PUMPS
Allis-Chalmers Mfg. Co.
Black-Clawson Company
Dorr Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Frederick Iron and Steel Co.
Hills-McCanna Co.
Ingersoll-Rand Co.
Johnson Corp.
Moore & White Co.
Nash Engineering Co.
Noble & Wood Machine Co.
Paper Converting Mch. Co.
Quimby Pump Co. Div. of H. K. Porter Company, Inc.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Warren Steam Pump Company
Worthington Pump & Machinery Corp.

RECOVERY SYSTEMS
Bulkley, Dunton Pulp Co., Inc.
Rodney Hunt Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Pusey & Jones
Ross Engineering Corp. J. O.
Valley Iron Works Co.

RECTANGULAR BINS
Traylor Engineering & Mfg. Co.

REELS
Black-Clawson Company
Downingtown Mfg. Co.
De Laval Steam Turbine Co.
Hudson Sharp Machine Company
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Rodney Hunt Machine Co.
Rotogravure Engrg. Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
The Smith & Winchester Mfg. Co.

REFINERS
Appleton Machine Co.
Bahr Brothers Mfg. Co.
Bauer Brothers Co.
Dilts Machine Works
The Hermann Manufacturing Co.
E. D. Jones & Sons Co.
Murray, D. J. Mfg. Co.
Noble & Wood Machine Co.
Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Sprout, Waldron & Co.
Sutherland Refiner Corp.
Valley Iron Works

REGULATORS
Allis-Chalmers Mfg. Co.
Armstrong Machine Works
Bird Machine Company
The Brown Instrument Co.
The Foxboro Company
Jones, E. D., & Sons Co.
General Electric Co.
Johnson Corp.
Leeds & Northrup Company
National Technical Laboratories
Noble & Wood Machine Co.
Shartle Brothers
Taylor Instrument Companies
Wallace & Tiernan
Westinghouse Electric & Manufacturing Company

RESINS
American Cyanamid & Chemical Corp.
The Neville Company
The Resinous Products & Chemical Co.

ROLLS
Appleton Machine Co.
Black-Clawson Company
Downingtown Mfg. Co.
Farrel-Birmingham Co.
Improved Paper Machy. Corp.
Lobdell Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
Montague Machine Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
Perkins, B. F., & Sons Co.
Pusey & Jones Corp.
Roehlen Engraving Co.
J. J. Ross Company
Rodney Hunt Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Shenango-Penn Mold Co.
Sinclair Co.
Smith & Winchester Mfg. Co.
Stearns Magnetic Mfg. Co.
United States Rubber Co.
Valley Iron Works Co.
Waldron Corp., John

ROLL COVERS
The Cincinnati Rubber Mfg. Co.
Youngstown Welding & Engrg. Co.

ROLL STANDS
Cameron Machine Co.
Johnstone Eng. & Machine Co.
The Kohler System Company
Moore & White Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.

ROTARY KILNS
Traylor Engineering & Mfg. Co.

SATURATING MACHINES
Black-Clawson Company
Moore & White Co.
Noble & Wood Machine Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman C.

SCALES
Merrick Scale Mfg. Co.

SCREEN PLATES
Pitchburg Screen Plate Co.
Magnus Metal Corp.
Morey Paper Mill Supply Co.
Union Machine Co.
Union Screen Plate Co.

SCREENS
Allis-Chalmers Mfg. Co.
Appleton Wire Works
Appleton Machine Co.
Bird Machine Company
Carthage Machine Co.
Dilts Machine Works, Inc.
Downingtown Mfg. Co.
Harrington & King Perforating Co.
Hendrick Manufacturing Co.
E. D. Jones & Sons Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Traylor Engineering & Mfg. Co.
Valley Iron Works Co.

SCRUBBERS
Traylor Engineering & Mfg. Co.

SHEET MACHINES
Thomas W. Hall Co.
The Hermann Manufacturing Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
Valley Iron Works Co.

SHOWER PIPES
Bird Machine Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
Improved Paper Machy. Corp.
Moore & White Co.
Shartle Bros. Mach. Co.
Smith & Winchester Mfg. Co.

SHREDDERS
Bauer Brothers Co.
Carthage Machine Co.

SIZING
American Cyanamid & Chemical Co.
Black-Clawson Company
The Dow Chemical Co.
du Pont, E. I., de Nemours & Co.
National Oil Products Co.
Paper Makers Chemical Department, Hercules Powder Co.
Pioneer Salt Company
Socony-Vacuum Co.
Philadelphia Quartz Co.

SLITTERS
Black-Clawson Company
Cameron Machine Co.
Carthage Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co., Inc.
Hamblet Machine Co.
Hudson Sharp Machine Company
Johnstone Eng. & Machine Co.
Langston Co., Samuel M.
Moore & White Co.
D. J. Murray Mfg. Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Simonds Worden White Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.
Waldron Corp., John

SPRAY NOZZLES
The Spray Engineering Co.

STARCH
American Cyanamid & Chemical Corp.
Clinton Co.
National Starch Products, Inc.
Stein, Hall & Co., Inc.

WHERE TO BUY

STEAM SPECIALTIES
Johnson Corp.
Shartle Bros. Mch. Co.
Stickle Steam Specialties Co.

STRAPPING & STRAPPING MACHINES
The Stanley Works

STUFF CHESTS
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

SUCTION BOXES
Black-Clawson Company
A. E. Broughton & Co.
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Westinghouse Electric & Manufacturing Company.

SULPHUR
American Cyanamid & Chemical Corp.
Stauffer Chemical Company
Texas Gulf Sulphur Co.
Witco Chemical Company

SULPHUR BURNERS
Valley Iron Works Co.

TALC
American Cyanamid & Chemical Corp.
W. H. Loomis Talc Corp.
International Talc Company

TANKS
Frederick Mfg. Co.
E. D. Jones & Sons Co.
Kalamazoo Tank & Silo Co.
The Manhattan Rubber Mfg. Division of Raybestos-Manhattan, Inc.
The Noble & Wood Machine Co.
H. K. Porter Company Inc.
Rodney Hunt
J. O. Ross Engrg. Corp.
Shartle Brothers Machine Co.

Traylor Engineering & Mfg. Co.
United States Rubber Co.
Waldron Corp., John
Youngstown Welding & Engrg. Co.

THICKENERS, DECKERS & SAVEALLS
Bird Machine Company
Bulkley, Dunton Pulp Co. Inc.
Carthage Machine Co.
Dilts Machine Works
Dorr Co.
Downingtown Mfg. Co.
Montague Machine Co.
Moore & White Co.
D. J. Murray Mfg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Valley Iron Works Co.

TITANIUM
E. I. Du Post de Nemours & Co.
Titanium Pigment Co.
R. T. Vanderbilt Co.
Witco Chemical Company

TOOLS
Acme Steel Company
Ingersoll-Rand Co.
The Stanley Works
Walworth Company

TRUCKS
Elwell Parker Electric Co.
Wright-Hibbard Ind. Elec. Truck Co.

TRAPS
Armstrong Machine Works
Crane Co.
Grinnel Company
Johnson Corporation
Shartle Bros. Mch. Co.

TUBS
Rodney Hunt Machine Co.
Noble & Wood Machine Co.
Shartle Brothers
Valley Iron Works Co.

TURBINES
Allis-Chalmers Mfg. Co.
De Laval Steam Turbine Co.
General Electric Company
Hunt, Rodney, Mach. Co.
Westinghouse Electric & Manufacturing Company
Worthington Pump & Machinery Corp.

USED EQUIPMENT
Frank H. Davis Company
Gibbs-Brower Co.
Thomas W. Hall Co.
Noble & Wood Machine Co.
Rotogravure Engrg. Co.
J. J. Ross Company
Shartle Brothers Machine Co.

VALVES
Crane Company
Dilts Machine Works
The Foxboro Company
Hills-McCanna Co.
E. D. Jones & Sons Co.
Kennedy Valve Mfg. Co.
Magnus Metal Corp.
D. J. Murray Mfg. Co.
Noble & Wood Machine Co.
The Permutit Company
William Powell Co.
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Taylor Instrument Companies
Valley Iron Works Co.
Walworth Company

VATS & VAT PARTS
Union Machine Co.
Union Screen Plate Co.

WASHERS
Bird Machine Company
Downingtown Mfg. Co.
E. D. Jones & Sons Co.
Moore & White Co.
Noble & Wood Machine Co.
The Sandy Hill Iron & Brass Works
Rodney Hunt Machine Co.
Shartle Brothers Machine Co.
Valley Iron Works Co.

WATER CONDITIONING
The Permutit Company

WAXING MACHINERY
Black-Clawson Co.
Potdevin Machine Co.
Rotogravure Engrg. Co.
Shartle Brothers Machine Co.
Waldron Corp., John
Weber, Herman G.

WELDING EQUIPMENT
Allis-Chalmers Mfg. Co.
General Electric Company
Walworth Company
Westinghouse Electric & Manufacturing Company

WET MACHINES
Black-Clawson Co.
Carthage Machine Co.
Downingtown Mfg. Co.
Moore & White Co.
Montague Machine Co.
Noble & Wood Machine Co.
Pusey & Jones Corp.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Shartle Brothers Machine Co.
Smith & Winchester Mfg. Co.
Valley Iron Works Co.

WINDERS AND REWINDERS
Black-Clawson Company
Cameron Machine Co.
Dietz Machine Works
Downingtown Mfg. Co.
Thomas W. Hall Co.
Hudson-Sharp Mach. Co.
Langston Co., Samuel M.
Johnstone Engr. & Machine Co.
The Kohler System Company
Montague Machine Co.
Moore & White Co.
Paper Converting Mch. Co.
Potdevin Machine Co.
Pusey & Jones Corp.
Rotogravure Engrg. Co.
J. J. Ross Company
The Sandy Hill Iron & Brass Works
Smith & Winchester Mfg. Co.
Waldron Corp., John

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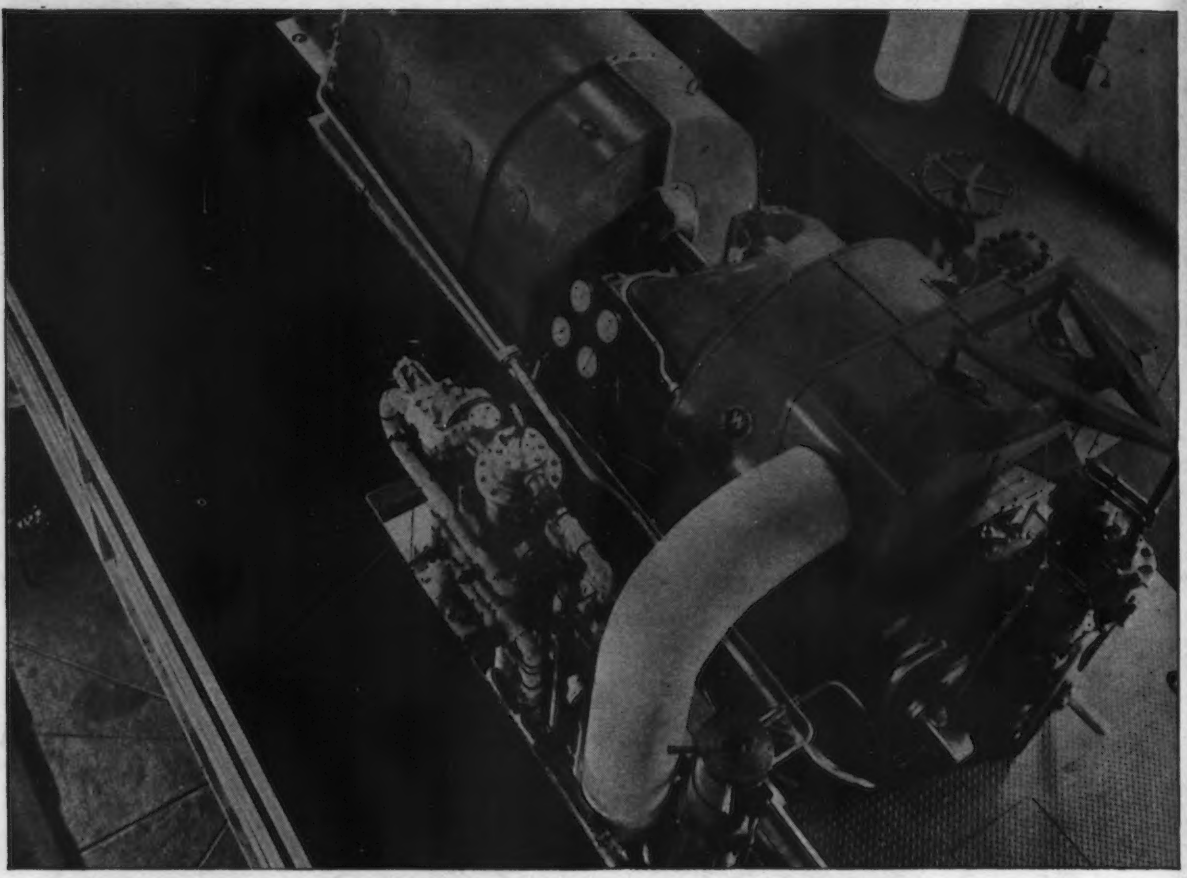
April 19, 1945



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